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ABSTRACT

Clustered Health Occupations Reading Strategies is one of four instructional guides developed to assist teachers working with students considered disadvantaged because of reading deficiency. Section 1 concerns readability and gives procedures and guidelines for collecting samples. Section 2 briefly describes the Cloze procedure and its usefulness as a reading test and teaching technique. Informal assessment is the focus of section 3. Three informal assessments with sample answer sheets and suggested-approximate answers are provided. Section 4 is an introduction to the guide (sections 5-10) which offers ideas and procedures for integrating reading skills with the occupational content (vocational textbook). Sections 5-8 each present a set of content reading skills: vocabulary skills, comprehension skills (paragraph), comprehension skills (recognizing and recording complex information), and study/reading skills. Each skill is divided into segments requiring 5-20 minutes of class time for introduction and practice. Homework uses text assignments normally required. Each section introduces a skill, uses a variety of vocational examples to clarify it, provides exercises to apply and master the skill, and offers teaching suggestions. Section 8 also includes a section on suggested reinforcement activities. Section 9 offers guidelines for making a reading assignment. Section 10 makes further suggestions for reading skills development. (YLB)

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CLUSTERED HEALTH OCCUPATIONS READING STRATEGIES

1981 Vocational Reading Series

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CLUSTERED HEALTH OCCUPATIONS READING STRATEGIES

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VOCATIONAL READING SERIES

Division of Occupational and Vocational Studies
The Pennsylvania State University

Pennsylvania Department of Education
Bureau of Vocational Education

1981

FORWARD

Education amendments in 1976 (P.L. 94-482) provided for special assistance to a wide variety of students with "special needs." The special needs of these students are derived from conditions of the students which are believed to inhibit success in vocational programs. Both handicapped and disadvantaged individuals are to be served by the legislative provisions.

Academically disadvantaged students are those individuals who, because of math, reading, or communication deficiencies, may not be able to succeed in vocational programs. Legislation has provided for research and development projects to address the needs of these individuals. The projects in progress have been designed to respond to that call for research and development.

This instructional guide was developed for the purpose of assisting Health Occupations Teachers in their work with students who are considered disadvantaged because of reading deficiency. It was developed as a result of vocational reading research at The Pennsylvania State University. The guide was intended to be field tested in selected classrooms in 1981, funded by the Pennsylvania Department of Education.

"Clustered Health Occupations Reading Strategies" have been developed according to certain distinct characteristics of reading requirements in vocational education:

(1) Reading is a vocational skill, one that requires reading abilities that differ from those associated with general literacy.

(2) There is a difference between curricular literature (textbooks and other literature which must be read in the context of student status) and occupational literature (manufacturers instructions, codes, specifications, safety warnings, etc.).

(3) Occupational reading skills are appropriately addressed in the vocational curriculum.

(4) There are strategies available to vocational teachers which need little or no reading specialization.

(5) Available strategies reflect the unique qualities of vocational reading, address general vocational reading skill requirements, and are useful for helping students disadvantaged because of reading deficiencies.

This guide is NOT intended to be envisioned as the final word in reading strategies. It contains examples of several strategies believed to be useful for the vocational instructor seeking methods that are specifically related to health occupations instruction. The instructors are responsible for taking these examples and applying them to their occupational specialties. Not all of the methods will work for all health occupations teachers

or their respective students. The methods were designed to be adapted, not rigidly adhered to.

Companion R & D projects at Penn State provide useful complementary aids. An Employability Skills Curriculum Guide (Wircenski, McPherson, Feng, 1980) is available. That guide addresses socialization, financial management, values clarification, job procurement, and communication skills. Three other occupational clusters (Construction, Business, and Trade & Industrial) will be the basis for reading strategy guides. These guides will focus more specifically on the respective individual occupational areas utilizing a format similar to the health occupations guide.

Field testing during the 198[illegible] school year is expected to result in additional refinements of the several reading strategies. Criticism and recommendations are invited by all who receive these materials. Correspondence should be addressed to:

Director
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119 Rackley Building
The Pennsylvania State University
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L. Jay Thornton, PhD
Project Director
1981

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The Vocational Reading Series, of which this book is one part, has resulted from research conducted by the Division of Occupational and Vocational Studies, The Pennsylvania State University and the Bureau of Vocational Education, Pennsylvania Department of Education. Many people, not expressly identified as part of the project, have served willingly in the dispatch of its objectives. Appreciation is especially expressed to Mr. Wayne Grubb, Consultant for Disadvantaged and Handicapped, Bureau of Vocational Education, Pennsylvania Department of Education, for his support and procedural advice.

Several Area Vocational-Technical Schools in the Center Region of Pennsylvania participated in the development of the series. Scores of manufacturers, publishers, and employers provided literature and information. A listing of the schools, manufacturers, publishers, and employers follows. The project would have been impossible without their help.

Two research efforts provided considerable information toward the development of the series. The first, Basic Reading Skills and Vocational Education, was published by the National Center for Research in Vocational Education under the auspices of the Knowledge Transformation Project. That publication was supervised by Dr. Carol P. Kowle. The second, Review and Synthesis

of Reading In Post-Secondary Occupational Education, was published by the Division of Occupational and Vocational Studies in conjunction with the Division of Education Administration Policy Studies and The Pennsylvania Department of Education. Both titles are available directly from their respective publishers.

Appreciation is expressed to Mrs. Linda Cartright for her careful attention to the typing and proofreading of not only the final drafts of each title in the series, but all the preliminary work and intervening drafts required. The assistance of Edie Johnson, Division Secretary, and Jan Drew, Division Budget Secretary, is especially appreciated.

DISCLAIMER

The activity which is the subject upon which this guide was based was supported in whole or in part by the U.S. Department of Education. However, the opinions expressed herein do not necessarily reflect the position or policy of the U.S. Department of Education, and no official endorsement by the U.S. Department of Education should be inferred.

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TABLE OF CONTENTS

	Page
FORWARD	iii
ACKNOWLEDGEMENTS	vii
DISCLAIMER	ix
LIST OF PARTICIPATING SCHOOLS	x
LIST OF PARTICIPATING PUBLISHERS	xi
LIST OF PARTICIPATING MANUFACTURERS AND EMPLOYERS	xii
LIST OF FIGURES	xx
SECTION	
I. READABILITY	1
Readability Procedures	4
Instructions for Calculations	11
Exercise A	16
Samples: How Selected and How Many	22
Exercise B	24
The Problem with Readability Analysis	26
II. CLOZE PROCEDURE	31
Student Reading Ability	33
Exercise A	42
Case Grammar and the Cloze Procedure	46
Exercise B	48
III. INFORMAL ASSESSMENT	51
Procedure	53
Purpose	54
Administration	55
Scoring and Reporting	56
Assessments	57
Assessment One - Vocabulary	58
Sample Answer Sheet	64
Suggested-approximate answers	67
Assessment Two - Comprehension	69
Sample Answer Sheet	76
Suggested-approximate answers	81
Assessment Three - Study/Reading Skills	85

TABLE OF CONTENTS (Continued)

SECTION		Page
IV.	INTRODUCTION TO THE GUIDE	87
	Reading the Vocational Text/Skill Presentation	89
	Purpose	89
	Organization	89
V.	DEVELOPING VOCABULARY SKILLS	91
	Contextual Analysis	93
	Formal Definitions	94
	Exercise A.	94
	Synonyms	95
	Exercise B	96
	Inferential Clues	97
	Exercise C.	97
	Illustrations	99
	Exercise D	101
	Glossaries	106
	Exercise E	106
	Contextual Analysis	107
	Formal Definitions	107
	Synonyms.	107
	Inferential Clues	108
	Illustrations	108
	Glossary	109
	Procedures	109
VI.	DEVELOPING COMPREHENSION SKILLS: THE PARAGRAPH	111
	Paragraph Subject	114
	Exercise A	114
	Paragraph Main Idea	115
	Exercise B	117
	Paragraph Supportive Information	119
	Exercise C	120
	Paragraph Comprehension and Illustration	121
	Exercise D	126
	Procedures	132
VII.	DEVELOPING COMPREHENSION SKILLS: RECOGNIZING AND RECORDING COMPLEX INFORMATION	134
	Classification	137
	Exercise A	142

TABLE OF CONTENTS (Continued)

SECTION		Page
VII.	DEVELOPING COMPREHENSION SKILLS: RECOGNIZING AND RECORDING COMPLEX INFORMATION	
	Comparison	143
	Exercise B	146
	Cause and Effect	150
	Exercise C	152
	Exercise D	155
	Procedures	156
VIII.	DEVELOPING STUDY/READING SKILLS	157
	Purpose	159
	Survey	165
	Question	165
	Read	166
	Recite	166
	Revise	166
	Review	167
	Benefits of the SQ4R	167
	Teaching the SQ4R	168
	Study Reading Skills	169
	Exercise - Suggested Reinforcement Activities/Textbook	169
	Procedures	178
IX.	GUIDELINES: MAKING A READING ASSIGNMENT	179
	Discussion	183
X.	FURTHER SUGGESTIONS: READING SKILLS DEVELOPMENT	185
	BIBLIOGRAPHY	191

LIST OF FIGURES

		Page
Figure 1:	Sample Readability Graph	7
Figure 2:	Graph for Estimating Readability	8
Figure 3:	Flesch Readability Formula Procedure	10
Figure 4:	Sample with Word Count Over Words	12
Figure 5:	Sample Text with Syllables Marked	15
Figure 6:	Sample Graphs of GRL	23
Figure 7:	Readability Record	25
Figure 8:	Ethylene Oxide Sterilization Cloze Test	35
Figure 9:	Chair Operation Manual Cloze Test	39
Figure 10:	Illustrations	103
Figure 11:	Illustrations	105
Figure 12:	Illustrations	122
Figure 13:	Illustrations	123
Figure 14:	Illustrations	125
Figure 15:	Modified Outline Chart	141
Figure 16:	Comparison Chart	143
Figure 17:	Comparison Chart	144
Figure 18:	Comparison Chart	146
Figure 19:	Cause and Effect Chart	152

SECTION 1
READABILITY

In order to plan for intervening in situations of reading deficiency, several pieces of information are required. First, it must be known how urgent the need to read actually is, in the context of both curriculum and occupational requirements. This does not suggest that reading, in the general literacy sense, may not be important. Educators clearly recognize that reading ability is crucial if learning is to occur. What this first question addresses is an examination of objectives and their component tasks to ascertain how much reading is required to complete the tasks and, ultimately, the objectives of the course.

Although there has been little research to date to distinguish between curricular and occupational reading requirements, it is not difficult to visualize differences between textbook reading and, for example, manufacturers maintenance manuals. Effectively, there are two kinds of reading: That which is required to read the textbooks (curricular) and that required to read the manufacturer's instructions (occupational). Previous research (Thornton, 1977; 1979; 1980; 1981; Thornton, Waters, and Lee, 1980) suggests that there could be significant differences in the readability level of sections of textbooks dealing with specific tasks and the readability level of literature pertaining to the performance of those tasks.

It is a fact that reading literature peculiar to an occupational specialty at least implies that some form of reading is a vocational skill. Thus, the second bit of information must be collected. It must be known (or decided) if the teacher, the school, and the

school district intend to address reading within the vocational curriculum or as prerequisite skill. If reading is to be dealt with in the vocational curriculum, then all students must receive some form of vocational reading instruction. If, however, reading skill is envisioned to be prerequisite, then the thrust of reading in vocational settings would be toward dealing with deficiencies. The strategies, in the latter situation, would be individualized and delivered on a case by case basis.

The previous two pieces of procedural information are fairly general; the third and fourth are specific. The third deals with how difficult literature in a specific occupational curriculum is to read. What is the readability level? The fourth deals with how able students are in terms of reading ability. Can students read literature necessary to succeed in a vocational program? We shall deal with these issues separately.

Readability Procedures

Readability procedures are devices to estimate the grade reading level (GRL) of selected pieces of literature. In other words, a readability analysis determines the approximate GRL a person must possess in order to read the literature analyzed. Note the underlining of estimate and approximate. It must be cautioned that, although these procedures have been validated by extensive research, they are not the sole determinants of readability. Muncrief (1975) discussed a variety of other considerations that

are involved in readability assessments. For our purposes of matching literature assessment to student ability an index of readability is a useful measure.

There is a second caution needed about readability procedures. Preliminary results of current research (Thornton, 1981) brings up serious questions about trying to find an average readability level of occupational literature. For example, what does it mean that the average (the word "mean" is normally substituted for the word "average") readability level of a textbook is ninth (9th) grade? Because the word average or mean is used, it can be assumed that some of the literature is higher than ninth and some of it lower. What the average does not tell us is the range of readability levels and the concentration (mode at any level) of readability level.

In order to make sense out of that argument, a little must be known of how readability assessments are done. When analyzing a textbook (or any other lengthy piece of literature) random samples are selected. These samples are analyzed and an average of all of their readability levels is calculated. That average is the mean readability level of the literature. We will get more explicit about how this is done in the next section.

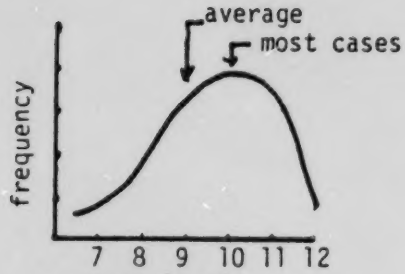
To point out the problem with using the mean (average) some hypothetical samples have been graphed below. The graphs show the curve which would result if the frequencies of grade level of samples were plotted on the graph. The vertical axis of the

graphs represents the frequency that samples were found to be at a particular grade level. The horizontal axis represents the specific grade levels. (See Figure 1)

All of the preceding graphs are of books at the ninth grade readability level. But they all differ in the concentration (mode) of levels. The point here is simply that the mean or average can be a deceptive statistic. The analysis can still be useful, providing the results include the range and distribution of readability scores sampled.

Two readability procedures will be discussed: (1) Fry procedure (See Figure 2); and (2) Flesch procedure (See Figure 3).

Figure 1: Sample Readability Graph



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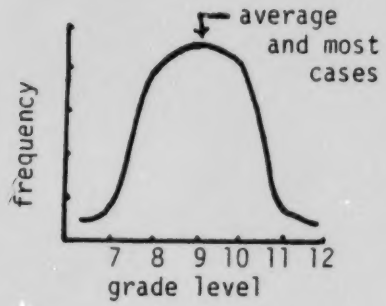

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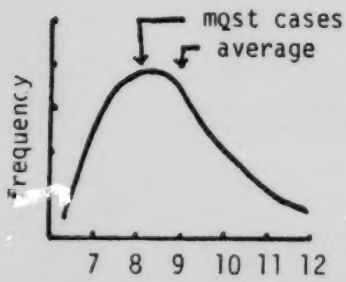

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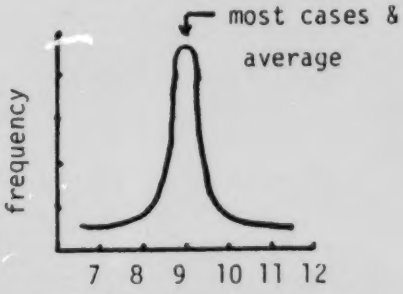

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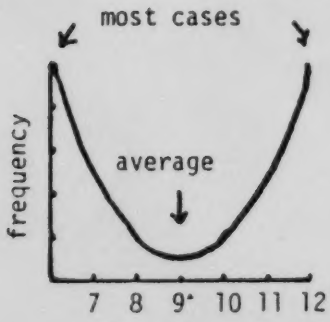
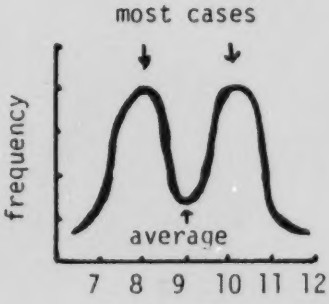


(most cases at highest
and lowest levels)



(most cases one grade
higher and lower than
average)

Figure 2: GRAPH FOR ESTIMATING READABILITY
by Edward Fry, Rutgers University Reading Center, New Jersey
Average number of syllables per 100 words

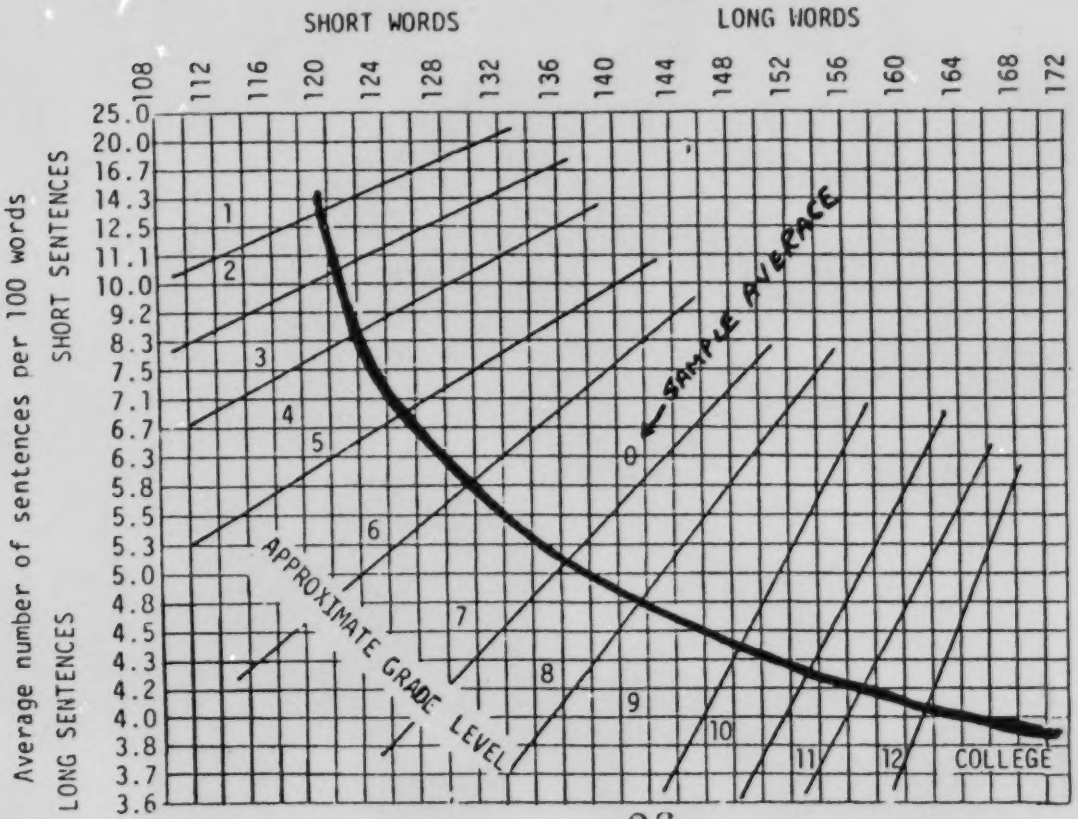


Figure 2 (Continued)

Directions: Use a stratified random procedure, at least five percent for books, more for shorter materials. For example: If a book is 350 pages long, five percent equals 17.5. 350 ÷ 17.5 equals 20. Select a starting number, for example: 6. The first sample page is 6; then 26; then 46; then 66; etc. If one of the pages has no text proceed one page at a time forward until a page is found from which a sample can be taken.

From each of these pages select 100 word passages (alternate positions on page from which taken. For example: beginning, middle, ending). Plot the average number of syllables and average number of sentences per 100 words on the above graph.

This will give you the average readability of the book.

Example:

	Syllables	Sentences
First 100 Words	124	6.6
Second 100 Words	141	5.5
Third 100 Words	158	6.3
Average	141	6.3

Then plot the syllables and sentences for each sample. This will illustrate the range of readability for the literature being analyzed.

(For further information and validity data, see April, 1968 Journal of Reading and March, 1969 Reading Teacher.)

Figure 3: FLESCH READABILITY FORMULA PROCEDURE

There is one readability procedure that is easily used with the assistance of a simple calculator. The Rudolph Flesch (1949) Readability Formula involves a count of the syllables in the sample and words per sentence in conjunction with a mathematical formula. The result is a "Reading Ease Score" which translates into grade reading level.

I. 1. Count the words in the sample (100 words or more, if available).
   2. Count the number of sentences.
   3. Divide the total number of words by the total number of sentences.
   4. Multiply that total (average number of words in a sentence) by 1.015.

II. 1. Count the syllables in the sample.
   2. Multiply the number of syllables by 100.
   3. Divide that total by the number of words in the sample.
   4. Multiply that total by .846.

III. Add I and II.

IV. Subtract III from 206.835.
That is the reading ease score. It translates accordingly:

R.E.Score	Grade	R.E.Score	Grade
115-120	1	80- 89	6
110-114	2	70- 79	7
105-109	3	60- 69	8.5
100-104	4	50- 59	11
90- 99	5	30- 49	14.5
		0- 29	College Grad.

Flesch, Rudolph. The Art of Readable Writing. New York: Harper and Brothers, 1949.

The textbook sample in Figure 4 demonstrates the rules.

Instructions for Calculations

WORD COUNT - Fry: Count all words up to 100 words (may end in partial sentence). Flesch: Count all words up to approximately 100 (end of full sentence).

Numbers - such as 30, 1951, 27-A, L78G are each counted as one word.

Hyphenated words - one word.

Abbreviations - one word.

Acronyms - such as PVA, NSU, USA, AVA are each counted as one word.

SENTENCES - Fry: Count the sentences and determine the tenth of a sentence when ending in a partial sentence. Flesch: Count all sentences.

Headings (paragraph headings) - one sentence.

Parenthetical expressions - (enclosed in brackets) is one sentence even if contained in another sentence.

Semi-colon or colon - If there is a semi-colon or colon in what we usually consider a sentence, that is considered to be another sentence. The easiest way to handle that is to count one sentence overall and add one sentence - count for each colon or semi-colon in the sentence.

RECORDING - Fry: Write down the number of sentences per 100 words. In the example the 100th word is "smaller." There are 8 full sentences, plus the partial sentence ending in "smaller." There are 4 words up to and including "smaller" and 23 words in the

FIGURE 4: SAMPLE WITH WORD COUNT OVER WORDS

1 2 3 4
CAUSES OF INEFFICIENT STERILIZATION

5 6 7 8 9 10 11 12
WHEN THE A.T.I. INDICATOR DOES NOT CHANGE COLOR

13 14 15 16 17 18 19 20 21 22 23 24
IT IS A SURE SIGN THAT THERE IS A DEFECT IN THE

25 26 27 28 29 30
STERILIZATION TECHNIQUE OR APPARATUS. NEVER NEGLECT

31 32
THIS WARNING.

33 34 35 36 37 38
CAUSES OF STERILIZATION FAILURE ARE NUMEROUS,

39 40 41 42 43 44 45 46
ELUSIVE AND OFTEN DIFFICULT TO LOCATE. THE DEFECT

47 48 49 50 51 52 53 54 55
MAY REQUIRE MINUTE EXAMINATION OF EVERY PART OF THE

56 57 58 59 60 61 62
AUTOCLAVE, THE LOAD AND PERSONNEL TECHNIQUES. BELOW

63 64 65 66 67 68 69 70 71 72
ARE LISTED SOME OF THE MOST COMMON POINTS TO LOOK

73
FOR:

74 75 76 77 78
A. FAULTY PREPARATION OF MATERIALS.

79 80 81 82 83 84 85 86
THE MANNER IN WHICH MATERIALS ARE PREPARED FOR

87 88 89 90 91 92
STERILIZATION EXERTS GREAT INFLUENCE ON THE

FIGURE 4 (CONTINUED)

93 94 95 96 97 98 99
EFFICIENCY OF THE PROCESS. GENERALLY SPEAKING, THE

100 101 102 103 104 105106 107 108
SMALLER THE PACK THE BETTER, AS A LARGER PACK

109 110 111 112 113 114 115
OBVIOUSLY WILL REQUIRE GREATER TIME FOR PENETRATION

116 117 118 119120 121
OF STEAM HEAT TO ITS CENTER.

(PRINCIPLES AND PRACTICES OF AUTOCLAVE STERILIZATION. NORTH HOLLYWOOD, CALIFORNIA: ASEPTIC-THERMO INDICATOR COMPANY, (NO DATE), P. 12)

sentence. Thus there are 8.2 sentences per 100 words. Flesch: Count to the end of the sentence in which the 100th word occurs. Therefore, there are 121 words and nine sentences. Enter these figures on the form and complete the math involved.

SYLLABLES - Syllables are counted in the same way for each procedure. An easy way is to count only those syllables over 1 for each word. For example:

1 2 3 4 5 6 7 8
Caus/es of in/ef/fi/cient ster/il/i/za/tion

Complete the counting for the entire passage in the same manner. Your total then is added to the total number of words (100 for Fry; 121 for Flesch, in this example). That gives you the total syllable count.

RECORDING - Fry: Write down the total number of syllables. On the graph plot the total syllables (across) to the number of sentences per 100 words. That will give you the approximate readability level of that passage. Flesch: Write down the number of syllables in the space on the form and complete the math as noted. Then add x and y and subtract that figure from 206.835. That is the Reading Ease score and translates to grade level on the chart.

The total sample syllable count and results for Flesch and Fry methods follow in Figure 5.

FIGURE 5: SAMPLE TEXT
WITH SYLLABLES MARKED

CAUS/ES OF IN/EF/FI/CIENT STER/IL/IZA/TION

WHEN THE A./T./I. IN/DI/CA/TOR DOES NOT CHANGE COL/OR IT IS A SURE SIGN THAT THERE IS A DE/FECT IN THE STER/IL/I/ZA/TION TECH/NIQUE OR AP/PAR/A/TUS. NE/VER NEG/LECT THIS WARN/ING.

CAUS/ES OF STER/IL/I/ZA/TION FAIL/URE ARE NU/MER/OUS, E/LU/SIVE AND OF/TEN DIF/FI/CULT TO LO/CATE. THE DE/FECT MAY RE/QUIRE MIN/UTE EX/AM/IN/A/TION OF EV/ER/Y PART OF THE AU/TO/CLAVE, THE LOAD AND PER/SON/NEL TECH/NIQUES. BE/LOW ARE LIST/ED SOME OF THE MOST COM/MON POINTS TO LOOK FOR:

A. FAUL/TY PRE/PAR/A/TION OF MA/TER/I/ALS.

THE MAN/NER IN WHICH MA/TER/I/ALS ARE PRE/PARED FOR STER/IL/I/ZA/TION EX/ERTS GREAT IN/FLU/ENCE ON THE EF/FI/CIEN/CY OF THE PRO/CESS. GEN/ER/AL/LY SPEAK/ING, THE SMAL/LER THE PACK THE BET/TER AS A LAR/GER PACK OB/VI/OUS/LY WILL RE/QUIRE GREAT/ER TIME FOR PEN/E/TRA/TION OF STEAM HEAT TO ITS CEN/TER.

The following results were obtained from readability analyses of the preceding sample.

Fry:

100 words

8.2 sentences

184 syllables

No record of this size on chart - Grade may not be inferred, select new sample

Flesch:

121 words

9 sentences

214 syllables

R.E. Score 43.57

14.5 grade

Exercise A

Following are three examples selected from other sections of the same literature. Practice the procedure, marking syllables and sentence count directly on the samples.

Exercise A - Sample 1

Sterilization Indicators

The above discussion has shown that to assure sterilization it is necessary that the materials be exposed to saturated steam at sufficient temperatures for certain minimum periods of time. Temperature recorders, pressure gauges, autoclave tape, etc., record conditions inside the autoclave surrounding the materials but do not give information as to conditions inside the packs.

Assurance of sterilization can be obtained through the use of a sterilization control placed in the central, least accessible portion of the materials, which will record the effects of the necessary elements for sterilization: time, temperature and saturated steam. The U.S. Pharmacopeia XVIII on page 831 states, "It

IS IMPORTANT TO CHECK THE HEAT DISTRIBUTION, PARTICULARLY IN NEW OR REMODELED AUTOCLAVES OR FOLLOWING CHANGES IN LOADING CONDITIONS, BY PLACING SUITABLE DEVICES TO REGISTER THE TEMPERATURES ATTAINED AT DIFFERENT HORIZONTAL AND VERTICAL PLANES IN THE STERILIZING CHAMBER. . . THESE DEVICES SHOULD BE CAPABLE NOT ONLY OF INDICATING THE ATTAINMENT OF AN EFFECTIVE STERILIZATION TEMPERATURE, BUT ALSO OF GIVING AN INDICATION OF THE DURATION OF THAT TEMPERATURE."

(IBID, P. 5)

Exercise A - Sample 2

Another very dependable sterilization indicator is A.T.I.'s Sterilometer™.

This is a convenient, individual disposable tag, with a wide bar impregnated with a special white chemical formulation that is sensitive to standard autoclave sterilizing conditions. (For reaction time, see specifications below). The Sterilometer Sterilization Indicator bar changes color from white to black when sterilizing conditions have been met inside a surgical pack in a standard 250°F. autoclave. Chemical formulation of the Sterilometer Sterilization Indicator is sensitive to the factors necessary for sterilization -- the correct combination of time, temperature, and saturated steam. The Sterilometer does not begin to react until live steam has penetrated to it. The wide bar turns black

ONLY WHEN SUFFICIENT TIME HAS PASSED FOR COMPLETE STERILIZING CONDITIONS, PLUS AN ADEQUATE MARGIN OF SAFETY.

(IBID, P. 8)

Exercise A - Sample 3

B. Improper Loading Of Autoclave.

Remember that steam flows from top to bottom. All layers of fabric material should be parallel and placed in the autoclave so that the layers are vertical rather than horizontal. Thus, steam will penetrate, flowing down between the layers of fabric rather than having to force its way through each layer. A Steam-Clox should be used in every large pack and in every drum, if drums are used.

All lids should be removed from jars, or partially removed, so that air will not be trapped. A good general rule is to place all utensils in the sterilizer in such a position that if they contained water, the water would all run out.

(Ibid, p. 13)

SAMPLES: HOW SELECTED AND HOW MANY

It is important, if an accurate picture of the literature is to be obtained, that the samples to be analyzed be selected at random. Too many subjective errors would be introduced by merely paging through the book, picking what appears to be representative samples. The easiest way and one that is sufficiently random is entitled a stratified random sampling.

In order to achieve the stratified random sample, it must first be decided how many samples are to be drawn. A useful rule is to select samples from 5% of the pages in the book. Remember, however, that the more samples drawn, the more accurate will be the analysis. That point is demonstrated in the following analyses (See Figure 6) of a medical assisting textbook under consideration in which 3, 6, 10, 15 were drawn. (Average was used in this case to distinguish between results of analyses in which increasing number of samples were drawn.)

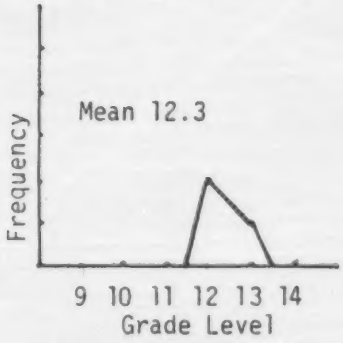
It is recommended that 5% sample or more be drawn for accuracy.

Procedure: Assume a book has 300 pages (not including glossary or index). A 5% sample requires (.05 x 300) 15 samples. To establish the starting page divide the total pages (300) by the total samples required (15). That result is 20. Randomly pick a number from 1-20. This can be done using numbers in a hat. That number is the starting page. Let's assume it is 6. The remainder of the pages are selected by adding 20 to 6, 20 to 26, 20 to 46, etc. until all the samples are drawn.

Figure 6: Sample Graphs of GRL
Frequencies: 3, 6, 10, 15 Samples

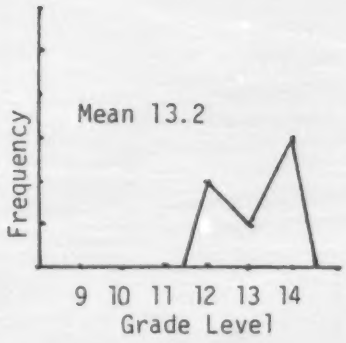
3 Samples

GRL	Freq.
12	2
13	1



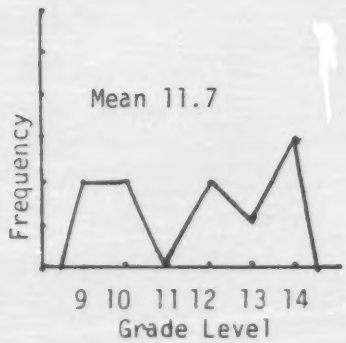
6 Samples

GRL	Freq.
12	2
13	1
14	3



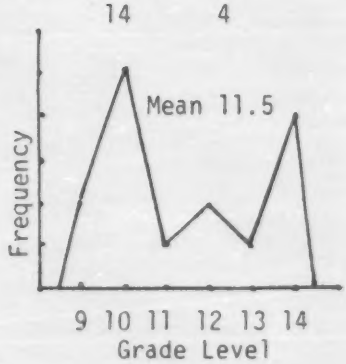
10 Samples

GRL	Freq.
9	2
10	2
12	2
13	1
14	3



15 Samples

GRL	Freq.
9	2
10	5
11	1
12	2
13	1
14	4



Now we know the pages of the book we will use in the analysis. If any of those pages contains no text (some may be pictures or diagrams) move one page at a time forward or backward until text is found. It is also recommended that the sample 100 words be selected alternatively from the beginning (B) and end (E) of the page. Therefore, page 6 would be 6-B (for beginning), page 26-E (for end), page 46-B, etc.

Exercise B

Compute a stratified random sample schedule for the following:

1. Textbook with 350 pages.
2. Textbook with 1000 pages.
3. Textbook with 525 pages.

If the literature you plan to analyze contains less than 200 pages, but more than 25, select 10 samples. For literature of less than 25 pages, but more than 5, select every other page. For literature less than 5 pages, take a sample of every page.

On the following page (See Figure 7) is a form to assist you in recording your findings. It is always a good idea to keep a file of literature analyzed.

Figure 7: Readability Record

Author(s):

Title of Literature:

Publisher:

Publication Data:

Total Number of pages:

Percent of pages sampled:

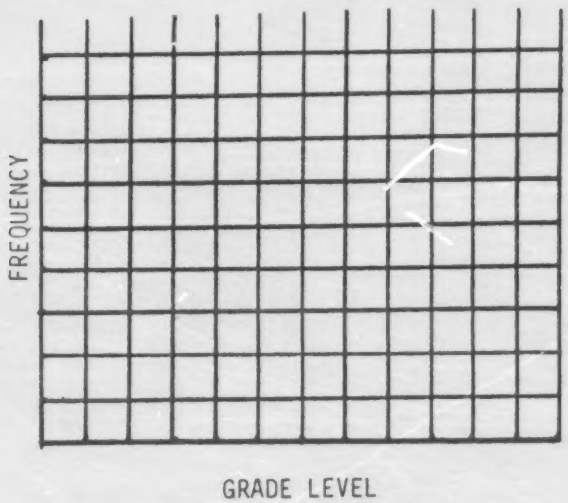
Procedure used:

Page numbers from which samples were taken:

Highest readability:

Lowest readability:

Graph for Plotting Results



(Thornton, Waters & Lee, 1980)

The Problem with Readability Analysis

Earlier it was mentioned that the GRL yield of readability procedures is actually an average (mean). In order for the mean to be an appropriate measure, certain conditions must be met. For example, the range must be closed; there must be a beginning and an end.

Readability yields are not based on a closed range. They begin at an arbitrary point, such as grade one, and end at another arbitrary point, such as grade 16. Reading occurs before grade 1 and after grade 16, but there are no levels to accommodate that reading. So, the mean is, by definition, inappropriate.

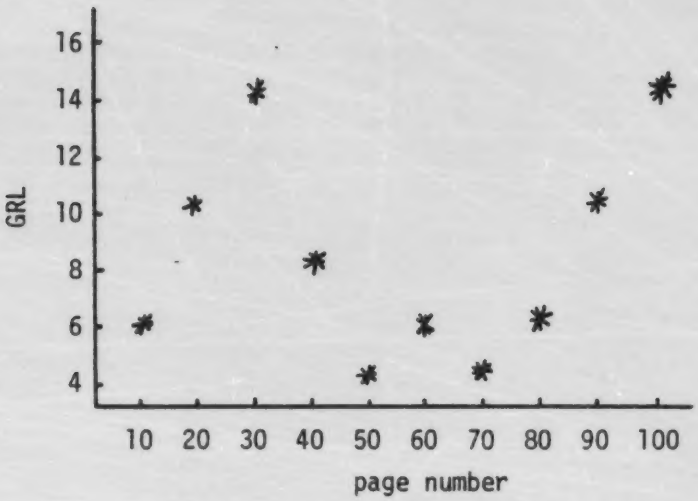
Another problem exists which is more devastating than statistical theory. Readability means assume unimodal distribution and no serious skew. Research attendant to the project (Thornton, 1981) demonstrated that occupational literature is seldom unimodal and, when it is, the distribution is often seriously skewed.

Moving away from statistical talk, what the research found was (1) GRLs were clustered at more than one level, such as at the 10th grade and 14th grade, and (2) when not clustered at more than one level, they contained extreme values which distorted the mean. The result of these conditions is that to report the average grade reading level of a health occupations textbook is nearly useless.

Assume for a moment that a publisher claims a book to be at the 10th grade reading level. What do you now know? Not much! First, readability formulas are accurate to about 1½ grades. Thus a 10th GRL really means 8½ to 11½. Second, the study referred to previously found standard deviations of 2-3 years. So the spread around the mean of 10 is plus or minus 2-3 years. Thus, considering the spread, the information found in a reported 10th GRL, is even more vague. The low end could actually be 5½ and the high end 14½. There is no way to tell.

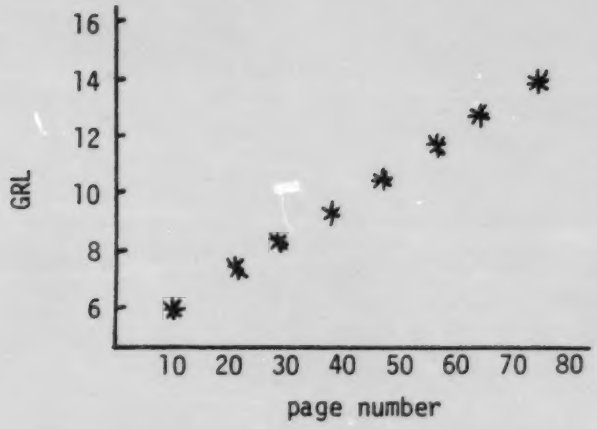
The statistical irregularity can be overcome. Instead of reporting an average GRL, you need to plot the sample GRLs in terms of page numbers in the text analyzed. Actually, this is easier than computing all the statistics mentioned above.

For each sample taken from a textbook plot the results on a graph with the horizontal axis representing page number in the text and the vertical axis being the GRL of that sample. The results would look like the following graph:



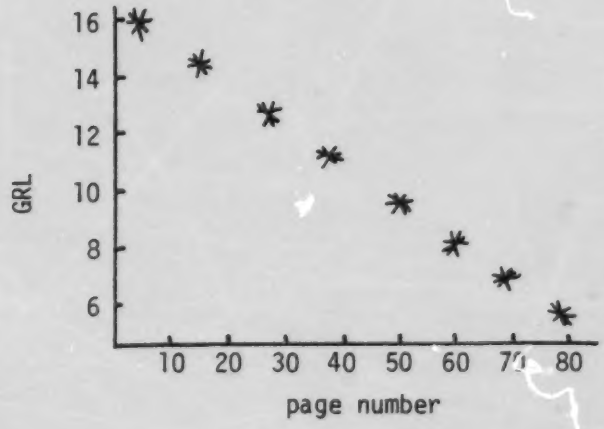
If you know your students have an approximate 8th grade ability, this graph demonstrates that at pages 20, 30, 90 and 100, they will probably have difficulty. The more samples you use, the more specific your information will be. At the problem points, you can intervene with the strategies to be discussed in this guide.

This method of analyzing a text accomplishes something else. Ideally, a textbook should begin at a reasonably low level and proceed to a reasonably high level. So a graph of the results should look like the following graph:



If the graph resulting from your analysis does not show progressive difficulty, the textbook may not be appropriate.

Lets say the graph shows the highest GRL at the beginning and decreasing difficulty thereafter:



Reading deficient students would be faced with the most difficult reading at the first contact with the book. When that happens, many students give up. The book is inappropriate.

It is possible that you have no choice and must use a textbook that is difficult at varying points. In that case, with the graphed reporting procedure, you will know about the difficulty and, where it exists, you can intervene. The mean GRL simply does not give this information.

Very few graphs will result in perfect lines, such as those shown. You must look for a trend, then you must account for any extremes. In any case, the graphed procedure permits locating potential problesm.

SECTION 2
CLOZE PROCEDURE

STUDENT READING ABILITY

Diagnostic reading test scores are often available for students in vocational programs. These scores, normally on file at the home school (in the counselors office at the comprehensive high school), are useful indicators of a student's general reading ability. How well they relate to vocational reading requirements is subject to conjecture. There simply has not been a concerted effort to separate vocational reading skill from general literacy skill. Because of these unknowns it is strongly recommended that you not accept a GRL score as final. Standardized reading test scores are useful indicators, but they should be supplemented with teacher made vocational reading tests.

A useful and highly adaptable reading test is the cloze procedure.

> The cloze procedure is an objective measure of language correspondence between reader and writer. It consists of a cloze (word) unit, a single occurence of a successful attempt to reproduce accurately a part deleted from a message, by deciding from the context that remains what the missing part should be (Taylor, 1953).

> The cloze procedure differs from vocabulary contextual texts. Rather than choosing omitted words because of definition and purpose, the cloze units are chosen mechanically; every fifth word, for example, occurring at any point in a continuous passage is omitted. The cloze design incorporates control against misrepresenting strength/weakness in content vocabulary as an indication of the test subject's ability/inability to read (Thornton, 1979).

Any piece of literature can be clozed. That includes textbooks, occupational literature, safety messages, codes, medical contraindications, literally anything. The procedure is described below:

1. Select a piece of literature.
2. Leave the first sentence intact.
3. Delete every fifth word.
4. Leave the last sentence intact.
5. Instruct the student to read the entire passage first, then begin filling in the blanks.
6. Instruct the student to be aware when guessing is the rationale for word selection, but to guess when other rationale fails.

Scoring the test is accomplished as follows:

0-39.9% Frustrational level (Student will not be able to read the literature)

40.0-69.9% Instructional level (Student will require intervention to be able to read the literature)

70.0-100.0% Independent level (Student is able to read the literature without intervention)

On the following pages two different cloze tests have been prepared using on-the-job literature. The correct words which have been deleted are listed following each example.

Figure 8: Ethylene Oxide Sterilization Cloze Test

Articles That Can Be Sterilized by Ethylene Oxide

Steam under pressure, dry heat, and ethylene oxide are the only sterilization methods recommended in a recent report on design and operation of central supply services by the Division of Hospital and Medical Facilities of the U.S. Public Health Service.[14]

Reports from a wide _____ of hospital and medical _____ indicate that ethylene oxide _____ be used exclusively, eliminating _____ steam (autoclaving) and _____ heat sterilization, provided that _____ time or enough equipment _____ available to handle the _____ exposure and aeration period _____.

Apparently any item may _____ sterilized with ethylene oxide _____ recommended conditions, without damage _____ the material or object _____ in the Ethylene Oxide _____ chamber.

FIGURE 8 (CONTINUED)

THE PENETRATING GAS _____ FAR SUPERIOR TO THE _____ SOLUTIONS OF "COLD STERILIZATION," _____ METHOD NOT RECOMMENDED IN _____ USPHS LIST. FOR THIS _____, ETHYLENE OXIDE STERILIZATION APPEARS _____ BE THE OBVIOUS REPLACEMENT.

_____ NOWHERE IS IT RECOMMENDED _____ ETHYLENE OXIDE BE USED _____ A REPLACEMENT FOR STEAM _____ (OR DRY HEAT, WITHIN _____ LIMITED SPHERE OF USEFULNESS). _____, ETHYLENE OXIDE, WHEN COUPLED _____ THE EFFECTIVE, ECONOMICAL, AND _____ STEAM STERILIZATION, IS INCREASINGLY _____ AS PROVIDING "THE COMPLETE _____ SYSTEM FOR EVERY HOSPITAL."[15]

_____ OXIDE CAN BE USED _____ THE STERILIZATION OF PLASTICS (_____ SEE WARNING NOTES BELOW), _____, METALS, LEATHER, WOOD, WOOL, _____, NYLON, GLASS, AND VIRTUALLY _____ OTHER MATERIAL. WHILE THE LIST OF EQUIPMENT AND MATERIALS AMENABLE TO ETHYLENE OXIDE

FIGURE 8 (CONTINUED)

STERILIZATION IS ENDLESS, HERE ARE SOME OF THE INSTRUMENTS AND EQUIPMENT ITEMS FOR WHICH IT IS RECOMMENDED.

PRINCIPLES AND PRACTICE OF ETHYLENE OXIDE STERILIZATION. NORTH HOLLYWOOD, CALIFORNIA: ASEPTIC-THERMO INDICATOR COMPANY, (NO DATE), P. 12.

FIGURE 8 (CONTINUED)

WORD LIST

RANGE	PLACED	ITS
SOURCES	STERILIZATION	INSTEAD
COULD	IS	WITH
BOTH	ANTISEPTIC	SAFE
DRY	A	HAILED
AMPLE	THE	STERILIZATION
WERE	REASON	ETHYLENE
LONGER	TO	FOR
NEEDED	BUT	BUT
BE	THAT	RUBBER
UNDER	AS	RAYON
TO	STERILIZATION	ANY

PRINCIPLES AND PRACTICE OF ETHYLENE OXIDE STERILIZATION. NORTH HOLLYWOOD, CALIFORNIA: ASEPTIC-THERMO INDICATOR COMPANY, (NO DATE), P. 12.

FIGURE 9: CHAIR OPERATION MANUAL CLOZE TEST

OPERATION

3.1 GENERAL

THIS SECTION INCLUDES SIMPLE AND EASY TO FOLLOW INSTRUCTIONS AND PROVIDES A THEORY OF OPERATION FOR THE MAXI CHAIR MC80. OPERATOR MUST BE _____ THOROUGHLY FAMILIAR WITH THIS _____ BEFORE ATTEMPTING OPERATION.

3.2 _____ OF OPERATION

THE MAXI _____ PROVIDES A LARGE VARIATION _____ POSITIONS BY MEANS OF _____ ELECTRICALLY ACTIVATED MOTOR-DRIVEN FUNCTIONS: _____, TILT, AND HEADREST. AN "_____ RETURN" FEATURE IS STANDARD _____ WILL RETURN CHAIR TO _____ EXIT POSITION. REFER TO _____ SCHEMATIC, FIGURE 3-1 AND _____ DIAGRAM, FIGURE 3-2.

3.3 _____

CHAIR LIFT IS ACTIVATED _____ SWITCHES S1 OR S2 (_____ CONTROL), WHICH DIRECT _____ TO THE LIFT MOTOR (_____). THE MOTOR/GEAR

FIGURE 9 (CONTINUED)

BOX, M1, _____ OR RETRACTS THE SPRING-ASSISTED _____ MECHANISM TO CAUSE UP _____ DOWN MOVEMENT OF THE _____.

3.4 TILT

CHAIR TILT _____ ACTIVATED BY SWITCHES S3 _____ S4, WHICH DIRECT POWER _____ THE TILT MOTOR (M2). _____ MOTOR/GEAR BOX, M2, EXTENDS _____ RETRACTS THE TILT MECHANISM _____ CAUSE FORWARD OR BACKWARD _____ OF THE CHAIR.

3.5 _____

THE HEADREST IS CONTROLLED _____ THE ACTIVATION OF SWITCHES _____ OR S6, WHICH DIRECT _____ TO HEADREST MOTOR (M3). THE MOTOR WILL THEN EXTEND OR RETRACT THE HEADREST TO THE EXTENT DESIRED OR TO THE LIMIT SWITCH SETTINGS.

OPERATION AND SERVICE MANUAL, MAXI CHAIR. NEWPORT BEACH, CALIFORNIA: SMR, 1979, P. 3-1

FIGURE 9 (CONTINUED)

WORD LIST

BE	CABLING	OR
SECTION	LIFT	TO
THEORY	BY	THE
CHAIR	DUAL	OR
OF	POWER	TO
THREE	M1	MOVEMENT
LIFT	EXTENDS	HEADREST
AUTO	LIFT	BY
AND	OR	S5
THE	CHAIR	POWER
THE	IS	

OPERATION AND SERVICE MANUAL, MAXI CHAIR. NEWPORT BEACH, CALIFORNIA: SMR, 1979, P. 3-1

Exercise A

Cloze the following passage and write out the instructions to the student regarding how they should proceed.

GETTING STARTED

Physical Examination - Every prospective employee is required to have a free complete medical examination to determine whether he or she is physically fit for the job. This examination is an important precautionary measure that protects you, your co-worker and patients in our hospital. An annual physical will also be scheduled near your anniversary date of employment.

Orientation - Prior to your starting date, a representative of the Personnel Department will meet with you to provide some of the basic information you will need to get started. At that meeting, you will receive information about your benefits, employee parking facilities, identification badge, and a copy of this handbook containing the work rules and regulations. (Employee Handbook. Philadelphia: Philadelphia College of Osteopathic Medicine. (No Date), p. 8)

Exercise A: Answer Sheet

Instructions:

Words List:

The cloze procedure can also be used as a teaching technique. A variety of cloze modifications are useful for vocational teachers.

The changes in the procedure reflect the purpose of the exercise. If, for example, an occupational instructor wishes to highlight functions of the skeletal system and be certain that the student reading the literature understands what is being read, the passage can be "clozed," deleting those words which are critical to the comprehension. The following skeletal system passage with "instructional modification" words (to be deleted) underlined illustrates the technique:

SAMPLE: INSTRUCTIONAL MODIFICATION CLOZE

The skeletal system comprises the bony framework of the body. It is composed of 206 bones in the adult and performs three main functions: support, protection, and movement. Bones give shape to the body as well as provide it with support. Many provide protection for the soft and delicate organs of the body: for example, the cranium protects the brain, the ribs protect the heart and lungs. Bones provide a place for the attachment of muscles, playing a part in the movement of the body by serving as passively operated levers.

> An additional function of bones is providing a storehouse of minerals that the body could draw from in case of inadequate nutrition. The long bones of the body are the site of blood cell formation. (Ferris and Skelly, 1979, p. 14)

Another modified cloze teaching technique is the "lexical cloze." Lexical is defined as relating to words of a language. The lexical cloze involves deletion of words according to the kinds of words they are, such as nouns, verbs, adjectives, etc. A later segment of this section develops case grammar modifications utilizing the lexical cloze, establishing applicability for occupational education reading intervention. The example which follows illustrates use of verb deletions in a female reproductive application. The words to be deleted have been underlined:

FEMALE REPRODUCTIVE SYSTEM

> The ovaries produce the female gametes, or ova. Ovaries contain thousands of microscopic sacs called graffian follicles in varying stages of development. Inside each follicle, an ovum develops. Usually only one follicle matures every twenty-eight days throughout the reproductive period of a woman, but occasionally two or more follicles may mature thus liberating more than one egg. (Gamete production ceases with menopause). As the follicle enlarges, it migrates to the outside surface of the ovary, breaks open, and the ovum is released from the ovary. This process is called ovulation and occurs about two weeks before the menstrual period begins; however, this time may vary somewhat with different individuals. (Ibid, p. 110)

Note that only the verbs involving an action on the part of the student have been marked for deletion. It is the activity that is emphasized in this reading intervention exercise.

When used as teaching technique, the cloze procedure is easily adapted to provide for increasing degree of difficulty. Often vocational students have experienced a history of failures in reading. The pattern is conducive to diminished motivation in an attempt to read. In order to break the pattern and increase the likelihood of a motivated reader, a pattern of reading successes is useful. Literature of any level of readability can be clozed. Thus, vocational literature at a low readability level can be used for those students who need a success stimulus. In addition, for teaching purposes, synonymous or words close to the correct word can be accepted. The number of clozed words can be decreased instead of following a schedule. The next example illustrates this point:

BODY MECHANICS FOR THE ASSISTANT

> Much of your work will require physical effort. Moving patients, carrying equipment, and pushing wheelchairs require muscle power. You will be less tired and less likely to strain yourself if you know how to use your body properly. Good body mechanics starts with proper posture. Correct posture is important in all positions, not only when you are standing. Correct posture makes lifting, pulling, and pushing easier. (Caldwell and Hegner, 1973, p. 38)

For the word "moving," the student would be correct inserting "assisting," for example. Note that only five deletions have been made and all are heavily clued.

CASE GRAMMAR AND THE CLOZE PROCEDURE

Gibson and Levin (1979) describe Fillmore's theory of case grammar. ". . . which imaginatively combines syntactic and semantic features." The study of meanings (semantics) and the orderly system of words (syntax) combine in Fillmore's Case Concepts (Brown, 1973). The theory of case grammar is easily adapted to teaching techniques using the cloze procedure. The following illustrations from The Nurse Assistant (1978) demonstrate the usage:

Agentive (A) - "The typically animate, perceived instigator of action."

The patient may fear the pain and physical discomfort that follow surgery (p. 8).

Instrumental (I) - "The inanimate force or object causally involved in the state or action named by the verb."

All the work you do will be directed toward one goal, the recovery of the patient (p. 13).

Dative (D) - "The animate being affected by the state or action named by the verb."

Always restrain yourself from loud emotional outbursts disturbing to patients or other workers (p. 25).

Factive (F) - "The object or being resulting from the state of action named by the verb."

Contaminated gowns and masks result from exposure to communicable diseases.

Locative (L) - "The location or spatial orientation of the state or action named by the verb."

Bedpans that are not sterilized after each use are left in the unit (p. 52).

Objective (O) - "The semantically most neutral case: anything representable by a noun whose role in the state or action named by the verb depends on the meaning of the verb itself."

Tray tables come in different designs (p. 88).

Benefactive (B) - "A noun deriving benefit of the action of the verb."

If oxygen is not piped in, an oxygen therapy technician will be responsible for setting up and maintaining oxygen cylinders and apparatus (p. 91).

Comitative (C) - "In accompaniment."

The most expensive and most important item of equipment in the unit is the bed (p. 118).

Temporal (T) - "When the verb is accomplished or occurs."

Do not leave the patient alone during this procedure, since it is not uncommon for a patient to become weak during the treatment (p. 194).

Modified cloze techniques can be used as introductory exercises, included in self-instruction packets, adapted for games, or structured for remedial work. They provide an excellent method of coordinating in-class vocational work and English or remedial reading treatment.

Exercise B

Underline each word in the following passage which could be clozed by Fillmore rules, entering above the word the letter which indicates the rule used.

THE PHYSICAL EXAMINATION

DORSAL RECUMBENT POSITION

The patient is flat on his back. Knees are bent (flexed) and slightly separated with feet flat on the bed. Loosen the gown at the neck. Cover the patient with a sheet. Place a small pillow under the head. This is the basic examination position.

HORIZONTAL RECUMBENT POSITION

The patient is flat on his back; his legs are slightly separated. A pillow is placed under his head.

KNEE-CHEST POSIITON

The patient is placed on his abdomen. Head is turned to one side on a small pillow. Arms are bent and rest on either side of head. Knees are flexed and drawn up to meet chest. This is a difficult position to maintain. The patient must never be left alone. Draping may be done with either one or two sheets.

This position is used to examine the anal and vaginal area.

PRONE POSITION

The patient is placed on his abdomen. Head is turned to one side on a small pillow. Arms are at sides or positioned on either side of head. One sheet is used for draping.

SIM'S POSITION

The patient is positioned on his left side. Head is turned to one side on a small pillow. Left arm is placed behind the body. Right arm is comfortably positioned in front. The left leg is slightly bent while the right leg is sharply flexed on adbomen. One drape is usually adequate. Sim's position is used for vaginal and rectal examinations and for giving enemas. (Caldwell and Hegner, 1973, pp. 142-144)

SECTION 3
INFORMAL ASSESSMENT

INFORMAL ASSESSMENT

Prior to the instruction of reading skills with the occupational literature, it is important to know your students' current reading performance. A standardized test is useful as a general screening device and yields composite scores in major skill areas -- e.g. vocabulary and comprehension. Another instrument is needed, however, to assess specific skills within the major skill areas -- e.g. contextual analysis, main idea, cause-effect relationship. The development and use of an informal assessment can meet this need.

Procedure

A. The first step in the development of an informal assessment is the establishing of a hierarchy of critical reading skills in which vocational students should show competence. The skills presented, for example, in this text have been determined as important for effective reading in the vocational materials. Also, the needs of your specific student population must be considered.

B. After determining the skills to be measured, then an order or matrix within each major skill area must be developed. The more reasonable order is proceeding from easy to more difficult.

C. Then the informal measure is designed based on the criteria in items A and B. Extractions from materials (textbook and manufacturer's) to be used in the occupational program

should be used in constructing the questions. Therefore, the questions require practical application of skills with materials students need to read and understand in class. The assessment becomes "tailor-made" to your course.

D. It is helpful to design pre and post assessments with similar levels of difficulty, and which measure the same skills in the same order -- two instruments that are as parallel as possible. These can be compared for program effectiveness and for evaluation of improvement of students' reading skills in your occupational area.

Purpose

The use of the informal reading skills assessment can accomplish three purposes for the vocational teacher:

A. It can be utilized as an identification procedure. After students have taken the assessment, you can recognize more clearly those students whose reading skills are noticeably inadequate. This measure helps you to identify the disadvantaged learner. If a student performs poorly on much of the assessment, he/she will probably have difficulty with your assigned vocational reading materials.

B. It can be utilized as a diagnostic procedure to determine which reading skills will require special attention in your instruction. After the assessment is scored, you

will be able to select those questions which were more frequently missed and identify the specific skills in which students are showing most difficulty.

C. It can be utilized as an evaluation procedure with vocational students growth (both group and individual) in reading skill performance. This can best be accomplished by using pre and post measures of the assessment. This pre and post testing can be used with a total skills program or can be done with skill segments. The results will be useful to the teacher for evaluating student progress and program effectiveness. The results can also be used as supportive data for reporting course or program success.

Administration

The informal assessment can be administered once or parallel tests can be given for a pre and post testing situation. A pretest is given before instruction and student practice, followed by a parallel posttest. As mentioned previously, the pre and post measures allow for comparison, and student progress and program effectiveness can be more completely evaluated. A single administration can also be beneficial as discussed in the "purpose" section. The results can be used for identification of disadvantaged learners, for identification of skills to be emphasized in instruction, and for information regarding students' reading performance.

Scoring and Reporting

Since the assessments are designed specifically for your program and they are not standardized, the scores can be reported in percentages (number correct divided by number possible). Each item should be assigned a point value with the total equaling 100. The results are best utilized when this is done for each of the major areas -- vocabulary, comprehension, and study skills.

Students should be given their scores so they recognize their own reading skill performance. A short reporting form with raw score and percentage provides good record for the student; individual skills tested with a raw score breakdown could be included to provide more specific information.

If you utilize a pre and post testing program, results can be reported in various ways. Students can be given both sets of scores for comparison and evaluation of growth. Data can be recorded to show program performance by: (1) listing all students raw and percentage pre and post scores together in chart form; (2) determining "percentage improvement" by students and recording in table form. An example of item 2 could be:

Comprehension - Test 2 (This can be done for each major area.)

1) 33 possible items

2) Approximate time: 30 minutes

3) Content: Paragraph subject, supporting ideas, main idea, graphics

4) Results: 113 of 129 students showed improvement

Amount of percentage gained from pre to post score	Number of students
1 - 10%	36
11 - 20%	35
21 - 30%	20
31 - 40%	13
41 - 50%	7
50+	2

Scoring the assessments and reporting the results is helpful in many ways. Students can visually see reading performance. You, as vocational teacher, can determine which reading skills need emphasis. Plus, student and program performance can be more clearly seen.

Assessments

Following are three informal assessments, one for each of the major skill areas. Excerpts of occupational literature from varied trades have been utilized. It has been designed so that it can be given to all vocational students, even with the varied occupational material. Critical reading skills for vocational literature have been determined and they provide the structure for the three assessments.

The informal assessments (vocabulary, comprehension, study skills), can be administered as they are, or they can be used as models for your own construction of informal assessments. Sample answer sheets are also included. Plus, suggested "question-weight" is given, according to difficulty of task. This is a guideline; you may devise your own point system.

ASSESSMENT ONE -- VOCABULARY

This activity will help you to measure your present vocabulary performance. Answer as accurately as possible. Please reocrd all responses on the provided answer sheet.

A. Formal Definitions (2 points each definition)

Directions: The following exercise measures your ability to determine the meaning of a word by understanding the formal definition given. Write a definition for each underlined words or phrase

1.) A vocation is a job for which a person is specially trained. (Ray & Lewis, 1980, 31)

2.) Face-to-face listening, listening done as part of a two-person conversation, and listening done as a member of a small group are all referred to as small-group listening. (Rowe & Jimerson 1971, 19)

3.) Since the goal at this stage of construction is to enclose the structure and make the roof watertight, only those partitions that support the ceiling and/or roof (bearing partitions) are usually installed. (Wagner, 1979, 142)

B. Synonyms (1 point for each answer - 7 points total)

This section will measure your ability to determine meaning of a word by locating synonyms -- one word or a small phrase which has a similar meaning and which serves to explain. Write that single word or phrase which is a synonym for the underlined word(s).

1.) One must understand the system to accurately diagnose (identify) mechanical difficulties. (Althouse, Turnquist & Bracciano, 1975, 99)

2.) Carbohydrates are classified as monosaccharides, or simple sugars, when they contain one basic sugar unit ($C_6 H_{12} O_6$). (Morgan, 1974, 49)

3.) The surface may spall (chip or crumble away) if subjected to moisture and freezing. (Wass & Gordon, 1981, 134)

4.) Pick out the terms and the appropriate synonyms in this paragraph:

When these lines of force encounter a longitudinal (lengthwise) crack, they lean through and become points of surface attraction for the magnetic powder dusted on the surface. A transverse, or crosswise crack, would not show because the lines of force would be parallel with the crack. (Sacks, 1976, 361)

C. Inferential Clues (3 points each definition)

This section will require you to use clues from the surrounding context to determine the meaning of an unfamiliar term. Write a definition for each underlined word by using the clues within the paragraph.

1.) Early Ambulation. It is common practice to get the patient out of bed hours after surgery, instead of keeping him in bed for prolonged periods, which adds to his discomfort and delays his recovery . . . You should remain with the patient the first few times that he is out of bed. Assist him to dangle his feet at the side of the bed for a few minutes so that his circulatory system can adjust to his change of position. When he no longer feels dizzy or light-headed, assist him to stand, take a few steps, and sit in a chair. In the postoperative orders, the patient's doctor will specify when the patient is to be ambulated, how often, for how long a period of time, and with what, if any, limitation. (Wood & Rambo, 1977, 493)

2.) In planning interior display it is necessary to take into consideration a whole interior and not just an individual display. In order to obtain a harmonizing effect from displays, the interior planning should include decorations, layout, and merchandise displays. Decorations include the lights, fixtures, walls, ceiling and floors. The layout involves the placement of the tables, showcases, racks, and other equipment. The displays involve the actual placing of merchandise on the counters, the floor, the shelves, and in showcases. (Everard & Shilt, 1979, 207)

3.) Before repainting, the probable cause of the trouble should be ascertained. If it is due to springtime blistering on localized areas on the house in the colder northern states, a more effective vapor barrier is needed. This can be obtained by painting the indoor side of the exterior walls. Two coats of

aluminum paint plus two coats of decorative paint are best for sand-finish plaster. On smooth plaster, a primer-sealer and at least one coat of semigloss paint make a good barrier. Shutting off humidifiers will also help. (U.S. Dept. of Agriculture, 1973, 13)

4.) For this paragraph, define the underlined word, and list the words or phrases (clues) which helped you to understand the meaning of that word.

Sedation is used for the dental patient to relieve apprehension and fear. The techniques and drugs used do not render the patient unconscious, and their protective reflexes remain intact. The patients, at proper levels of administration, will respond to commands by the dentist and assistant and are able to cough, swallow, breathe, and maintain all physiologic functions at reduced levels. (Richardson & Barton, 1977, 453)

D. Illustrations (3 points each definition)

The next questions will measure your ability to define words through the use of drawings and photographs.

1.) Look at the drawing carefully. What is the meaning of gesticulating?

The gesticulating speaker communicates her own nervousness.

(Rowe & Jimerson, 1971, 84)

2.) Use the drawing and the paragraph from a textbook on machining to determine what parallels are.

Parallels, Figure 7-36, can be made from standard steel shapes or from special steel that is heat treated. The heat treated steel is then ground to size. Parallels are helpful for raising work in the vise so drilling can be better observed. Parallels must be located so the drill does not come in contact with them when the drill breaks through.

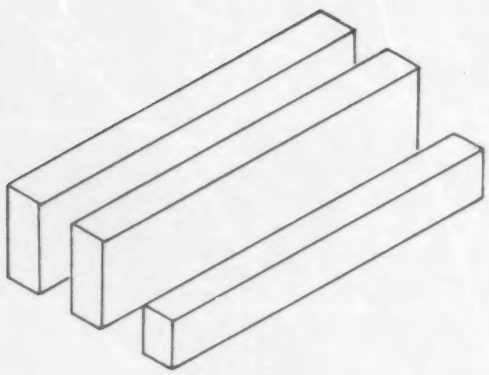
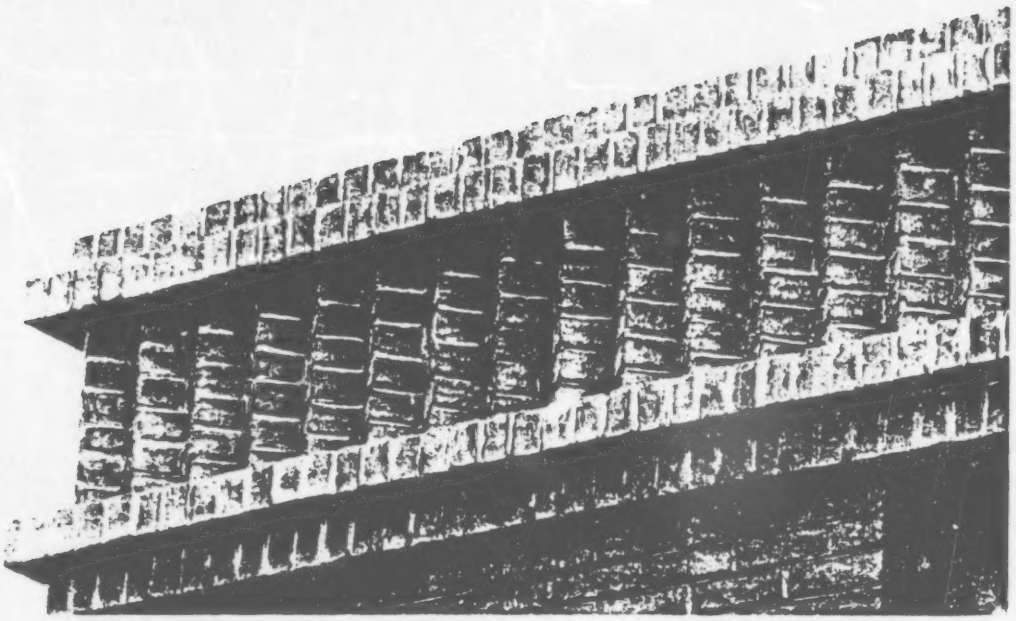


Fig. 7-36. Steel parallels.

(Walker, 1977, 104)

3.) Look at the following photograph carefully, What is brick corbelling?



(Kreh, 1976, 210)

E. Content Vocabulary (4 points each paragraph)

The following section will require you to recognize content vocabulary words. Read each paragraph and list on your answer sheet those words or phrases specific to the given occupation (A) that you would need to know to understand the reading material, and (B) that are common to that occupation.

1.) Occupation: Food Preparation

Originating in many different parts of the world, spices, herbs, and other flavoring agents are parts of plants, flowers, or complete agricultural products, used to add zest to a dish. Although they often were used in the past to mask a taste generated by spoilage or decay of a food, they are presently used (in most cases) to enhance the flavor of a culinary work or to give unusual stimulation to a traditional dish. (Morgan, 1974, 47)

2.) Occupation: Welding

The single-bevel T-joint is able to withstand more severe loads than the square T-joint. It can be used on plate thicknesses ranging from 3/8 to 5/8 inch. Plate of greater thickness can be welded with the submerged arc process. Cost of preparation is greater than for the square T-joint, and fitup is likely to take longer. Electrode costs are less. (Sacks, 1976, 123)

3.) Occupation: Business/Management Tactics

A lockout is a temporary work stoppage by an employer in an attempt to win a dispute with the employees. In a sense, a lockout is a strike by the employer against the employees because management "locks the gates" and refuses to let workers enter the business. The lockout cannot be used as a device to discourage employees from joining or forming a union, although it was used extensively for that purpose prior to the passage of certain laws. Today employers seldom close their businesses in order to pressure employees to negotiate even though they have the right to do so. (Everard & Shilt, 1979, 453)

*This assessment has been assigned 49 points. To facilitate scoring, it is suggested to award the extra point to each student or to devise a one-point item.

ASSESSMENT ONE -- VOCABULARY

SAMPLE ANSWER SHEET

Name _____ Date _____

A. Formal Definitions

1.) _____

_____

2.) _____

_____

3.) _____

_____

B. Synonyms

1.) _____

2.) _____

3.) _____

4.) Term _____ Synonym _____

5.) Term _____ Synonym _____

C. Inferential Clues

1.) What is early ambulation? _____

_____

_____

2.) What is interior display? _____

_____

_____

3.) A. What does ascertained mean? _____

_____

B. What is vapor barrier? _____

_____

_____

4.) A. What is sedation? _____

_____

_____

B. List the clues: _____

_____

_____

D. Illustrations

1.) Gesticulating: _____

_____

_____

2.) Parallels: _____

_____

_____

3.) Brick Corbelling: _____

_____

_____

E. Content Vocabulary (You may list in 2 columns.)

1.) Food Preparation:

2.) Welding:

3.) Business/Management Tactics:

VOCABULARY ASSESSMENT

SUGGESTED - APPROXIMATE ANSWERS

A. Formal Definitions (Answers should be close to these.)

1.) vocation - job for which a person is specially trained.

2.) small-group listening - includes face-to-face listening, listening in a two-person conversation, and listening in a small group.

3.) bearing partitions - those partitions that support the ceiling and/or roof.

B. Synonyms (Answers should be exact.)

1.) (diagnose) - identify

2.) (monosaccharides) - simple sugars

3.) (spall) - chip or crumble

4.) A. longitudinal - lengthwise
B. transverse - crosswise

C. Inferential Clues (Answers will vary but same main point should be included.)

1.) early ambulation - having the patient out of bed and walking a few hours after surgery.

2.) interior display - includes planning for the inside of an entire space, and the decorations, layout and merchandise displays should be coordinated.

3.) A. ascertained - determined or understood
B. vapor barrier - that process which keeps out the moisture

4.) A. sedation - techniques and drugs used by dentists to calm a patient and to relieve pain that are safe and reasonable for patient.
B. Clues:
- to relieve apprehension and fear
- do not render patients unconscious
- protective reflexes remain in tact
- patients will respond to commands
- patient can maintain physiologic functions at reduced levels

D. Illustrations (Answers will vary but main points should be similar.)

1.) gesticulating - gesturing or using the hands and body to communicate ideas to your audience.

2.) parallels - heat-treated steel that is ground into rectangular bars of various sizes, according to need. They are useful during drilling for raising work in the vise.

3.) brick corbelling - bricks which form a shelf or ledge that are arranged in tight rows going across with corners exposed. Two rows of brick border the top and bottom of this arrangement which appears to be a strong construction.

E. Content Vocabulary (Answers may vary slightly.)

1.) Food Preparation:

spices
herbs
flavoring agents
agricultural products
spoilage or decay
enhance the flavor
culinary work
traditional dish

2.) Welding

single-bevel T-joint
square T-joint
plate thicknesses
submerged arc process
fitup
electrode costs

3.) Business/Management Tactics:

lockout
temporary work stoppage
employer, employee
strike
management "locks the gates"
union
negotiate
pressure

ASSESSMENT TWO -- COMPREHENSION

A. Paragraph Subject (2 points each)

Directions: This section will measure your ability to recognize the subject of the paragraph -- what it is about. For each paragraph record its subject in a phrase of approximately 3 - 7 words. Place all answers on the answer sheet.

1.) Many plastics products require thin walls, stiffness and low cost. A blow molded gallon milk bottle requires a minimum of material and is easier to handle when made from a stiff resin like high density polyethylene. On the other hand, flexibility is of value in designing squeeze bottles for hair shampoo or plastic tubing which must be coiled. (Baird, 1976, 77)

2.) The paper stencil method of screen printing is the least expensive and the simplest to prepare. The stencil can be easily cut from paper and attached to the screen. Paper used for making stencils must be tough (but not too fibrous) to prevent tearing and rough edges. If water-base ink will be used for printing, the paper stencil should be made of waterproof paper. (Broekhuizen, 1979, 182)

3.) A party who fails, after a reasonable time has passed, to perform contractual obligations has breached the contract. The breach occurs whether the party has completely or partially failed to perform. In the case of complete failure, the contract is terminated. Partial failure to perform may require the injured party to pay for the work that has already been done. (Rosenberg & Bonnice 1976, 57)

4.) The Code requirements for the installation and construction of recessed fixtures are given in Section 410-64 through 410-72. Of particular importance are the Code restrictions on conductor temperature ratings, fixture clearances from combustible materials, and maximum lamp wattages. Recessed fixtures generate a great deal of heat within the enclosure. Thus, these fixtures are a fire hazard if they are not wired and installed properly. (Mullin, 1981, 70)

B. Paragraph Main Idea (4 points each)

Directions: This series of paragraphs will require you to write a statement of main idea -- including the most important information in the paragraph. Please write in your own words. Record your statements of main idea on the answer sheet.

1.) Many people in the United States get a large part of their calories from sugar, fats, oils, and alcohol. Since these foods are high in calories and have few, if any, nutrients, they are known as empty calories. When people eat too many empty calories, they may not get enough of the nutrients the body needs daily. Eventually, they may develop poor nutrition and health problems. (Kowtaluk, 1977, 63)

2.) After the work has been "roughed down," it must be finish turned to attain the proper size and surface finish required. Generally, only one finish cut is taken since the diameter should be only .030 to .050 oversize after the rough cut. The lathe speed is usually higher than that used for rough turning and a finer feed is used. A sharp toolbit with a slight radius on the point is desirable for finish turning. If the roughing toolbit was used to turn only a few pieces, the cutting edge may still be keen and therefore can be used for the finish cut. (Krar, 1971, 80)

3.) By program implementation, we mean the task of actually converting a problem solution, existing perhaps in the form of a flowchart, into a computer program. This task involves a number of clearly identifiable steps. The first of these is coding; in other words, actually writing the instructions. It's a rare programmer who can write error-free code; thus a second step in this process is program debug, which simply means removing the errors (or bugs) from the program. The final step is program testing. In this step, the program is used to process realistic, representative data, and the results are compared with expected results. These three steps overlap a great deal, with errors frequently being detected during testing and removed (debugged) by recoding portions of the program. (David, 1978, 218)

4.) The seven convenience receptacles are located around the perimeter of the living room. These receptacles are the split-circuit type. That is, the bottom portion of each receptacle is switch-controlled and the top portion of each is hot at all times. These receptacles are controlled by two three-way switches. One switch is located near the front hall and the other is located next to the door leading to the kitchen. (Mullin, 1981, 99)

5.) The uninformed body mechanic will usually seize a rubber mallet or hammer and start the job by striking at the center of the damaged area. While this will force a large area of the sheet metal back into approximately its original position, actually additional damage is being created. In fact this roughing out procedure has not corrected any of the basic damage. That is still there and in most cases some marks of the roughing hammer or mallet plus some stretched metal have been added to the original damage. Extra time, therefore, is required to restore the panel. (Toboldt, 1979, 23)

C. Paragraph Supporting Ideas (3 points each)

Directions: This section will measure your ability to recognize ideas which lend support to or further explain the main idea of a paragraph.

1.) Reread the 5 paragraphs given in the main idea section (item B) and determine at least three supporting ideas for each paragraph. Use your constructed main idea for each paragraph to help you decide on the supporting ideas; be sure that each supporting idea relates to that main idea.

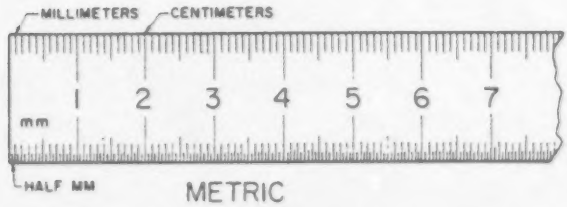
2.) List the supporting ideas in phrases (not a complete sentence) on the answer sheet.

D. Illustrations (3 points each)

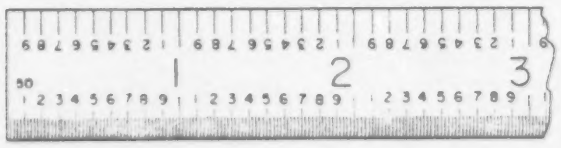
Directions: In this section you will be required to understand the meaning presented in three different types of illustrations. Write a brief explanation for the first two items; describe what you see and and what the illustration is trying to show you, the reader. What is the significance of each illustration? For the third item, label as directed.

1.) Describe the meaning of this illustration. What is it telling you, the reader?

FRACTIONAL INCH



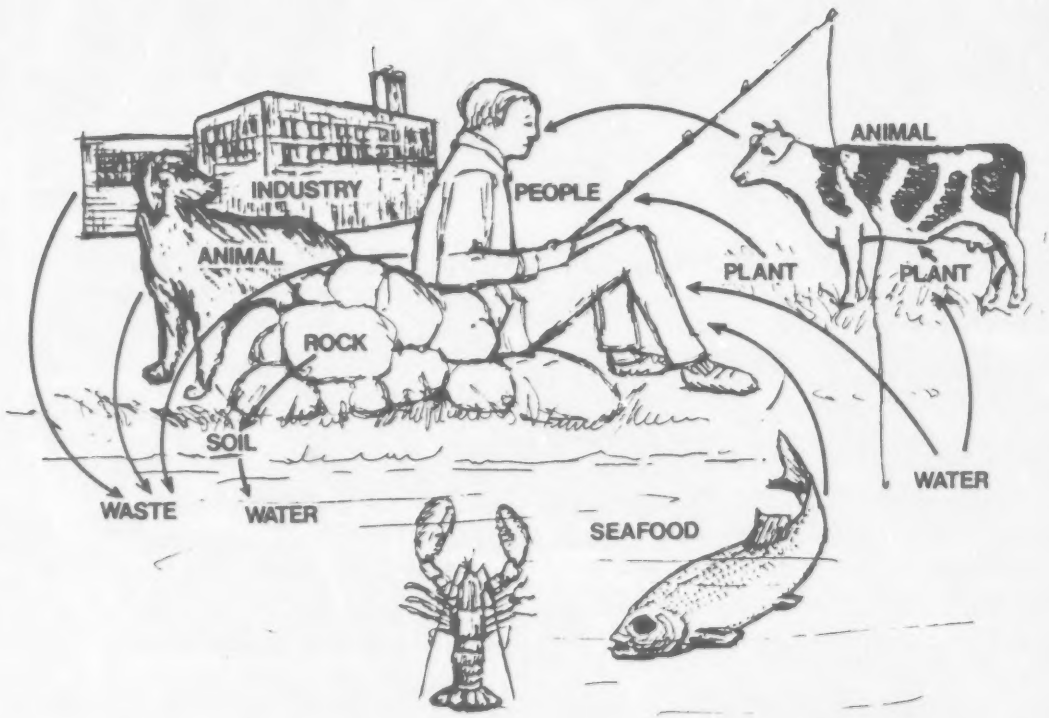
METRIC



DECIMAL INCH

(Walker, 1976, 39)

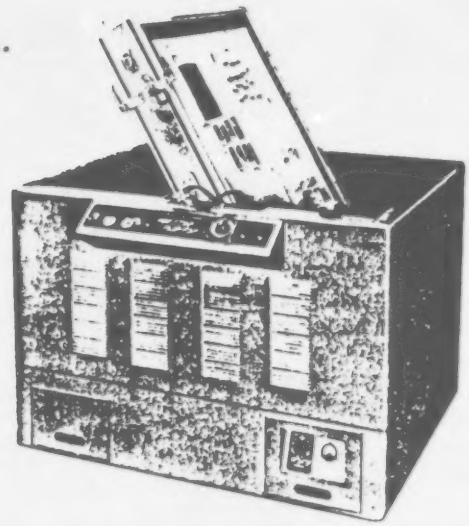
2.) Describe the process in this illustration. What is this cycle showing you?



(Kowtaluk, 1977, 32)

3.) The following illustration contains sequential pictures, which represent a process. Look at the pictures and then label accurately the text paragraph which is included on the answer sheet. Place the letter of each picture next to the appropriate sentence or sentences in the text paragraph which describes that picture.

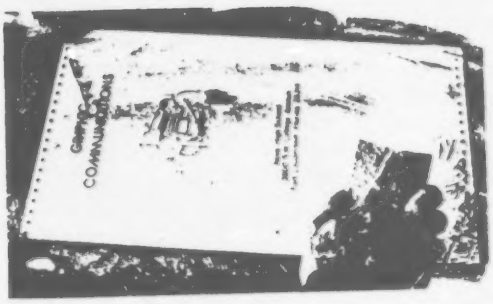
A.



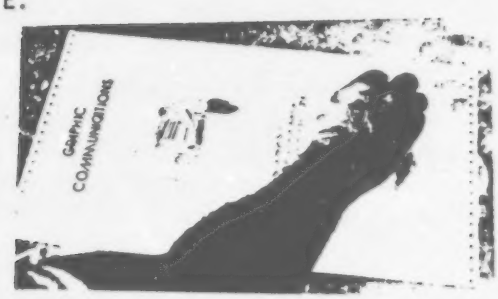
B.

C.

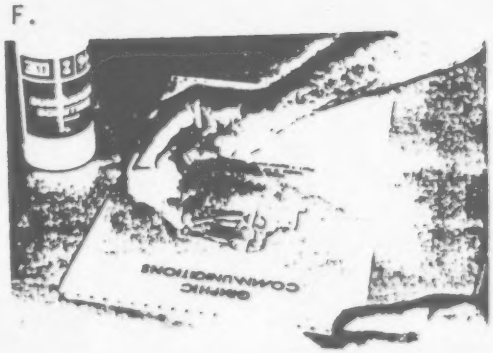
D.



E.



F.



(Broekhuizen, 1979, 252)

* Suggested point evaluations have been given for each section of this assessment. Points assigned to each answer will be determined by overall accuracy of answer. Other point systems may be assigned.

ASSESSMENT TWO -- COMPREHENSION

SAMPLE ANSWER SHEET

Name _____ Date _____

A. Paragraph Subject (Write a phrase)

1.)_____

2.)_____

3.)_____

4.)_____

B. Paragraph Main Idea (Write a sentence)

1.)_____

_____

_____

2.)_____

_____

_____

3.)_____

_____

_____

4.)_____

_____

_____

5.)_____

_____

_____

C. Paragraph Supporting Ideas (Write phrases)

1.)_____

_____

_____

_____

_____

2.)_____

_____

_____

_____

_____

3.)_____

_____

_____

_____

_____

4.)_____

_____

_____

_____

_____

5.)_____

_____

_____

_____

_____

D. Illustrations (Write a brief paragraph or label given paragraph.)

1.)

2.)

3.) After the flat has been prepared, a metal offset plate may be made. The platemaker is used for burning the plate. Open the vacuum frame and clean both sides of the glass to remove any dust or fingerprints. Place the metal plate in the vaccum frame with the presensitized side up.

Place the flat on top of the plate in the vacuum frame with the face up, or in a readable position. Align the gripper margin end of the masking sheet with one end of the plate. Close the vacuum frame, turn on the vacuum pump, and flip frame over so that the flat is now between the plate and the light source. Set the timer and expose the plate for desired length of time.

After exposure, the plate is rubbed up or developed to bring the image into view. Turn off the vacuum and remove the plate, placing it on a flat work surface. Pour a small puddle of process gum in the center of the plate and wipe it over the entire plate surface.

While the process gum is still wet, pour a puddle of developer on the plate. Use a sponge to spread developer over the entire plate surface. For best results, use very light pressure and long, even wiping strokes. The image will begin to appear as the plate is rubbed with the developer. Repeat the rub-up procedure for the second side of the plate. Apply running water to both sides of the plate to remove all traces of the developer. A cotton pad may be used to lightly wipe the plate surface during the rinsing operation.

Allow the plate to dry. Gum arabic is now used to coat the surface of the plate to prevent oxidation of the non-image areas. Gum arabic may be applied with a cotton pad to the entire plate surface.

COMPREHENSION ASSESSMENT

SUGGESTED - APPROXIMATE ANSWERS

A. Paragraph Subject (Answers should be concise -- not too general and not too specific.)

1.) Requirements for plastic products

2.) Paper stencil method of screen products

3.) Breach of contract: definition and consequences

4.) Code Requirements for installing recessed fixtures

B. Paragraph Main Idea (Answers will vary but these main points should be included.)

1.) Many Americans receive a large portion of their calories from "empty-calorie" foods and consequently may not get adequate daily nutrients.

2.) For proper size and surface finish, the roughed down work must be finish turned, generally with only one finish cut, done with a higher lathe speed and finer feed than used for rough turning.

3.) Program implementation, or the process of changing a problem solution into a computer program, includes the definite steps of coding, debugging, and testing which tend to overlap.

4.) The outer walls of the living room contain seven convenience receptacles of the split-circuit type, which are controlled by two three-way switches.

5.) The body mechanic who lacks knowledge about repair may strike the center of a damaged area on an automobile with a hammer and cause more damage and more time for repair.

C. Paragraph Supporting Ideas (Answers will vary but same ideas should be included.)

1.) A. foods high in calories, low in nutrition -- empty calories;
B. sugar, fats, oils, and alcohol -- empty calories foods;
C. people may develop poor nutrition and health problems.

2.) A. one finish cut, diameter should be only .030 to .050 oversize after the rough cut;
B. finish turning, sharp toolbit with a slight radius on the point is desirable for finish turning;
C. if roughing toolbit used to turn only a few pieces, cutting edge may be keen and usable for finish cut.

3.) A. problem solution existing perhaps in form of flowchart;
B. coding, actually writing the instruction;
C. program debug, removing the errors;
D. a rare programmer who can write error-free code;
E. program testing, program used for processing representative data;
F. testing, results are compared with expected results;
G. steps, overlap, errors found during testing, then removed by recording.

4.) A. split circuit, bottom portion switch-controlled and top portion hot always;
B. two 3-way switches, one near front hall and other next to door to kitchen.

5.) A. striking center, will force a large area of the sheet metal back into original position;
B. basic damage not corrected;
C. some marks of roughing hammer or mallet may be left;
D. stretched metal may have been added to original damage.

D. Illustrations (Answers will vary; main points should be included.)

1.) This illustration includes a comparison of three rules, each with a different type of measurement. The metric rule is compared to the fractional inch and the decimal inch rules.

2.) Chemical wastes from industry and other wastes from man and animal travel a continuous cycle from water and soil to plants, animals, and people and back into water and soil. Chemicals get into the food chain, either through soil and plants to animals or through the water to fish and animals.

3.) A - Open the vacuum frame . . . to . . . side up.
B - Place the flat on top . . . to . . . end of the plate.
C - Pour a small puddle of process gum . . . to . . . entire plate surface.
D - Use a sponge to spread developer . . . to . . . as the plate is rubbed with the developer.
E - A cotton pad may be used . . . to . . . during the rinising operation.
F - Gum arabic is used to coat . . . to . . . cotton pad to the entire plate surface.

ASSESSMENT THREE -- STUDY/READING SKILLS

To Teachers:

I. This assessment will determine more specific comprehension performance in "study situations." For this, you will use your own selected occupational materials which you will assign to your students for reading.

II. The following procedure is suggested for this informal assessment:

A.) Choose a two-page selection from your occupational text which is close to the beginning of a new chapter.

B.) Have students preview the selection (2-3 minutes). Do not explain guidelines to them; just assign the task.

C.) At the end of preview, ask students to write a preview recitation from memory -- any information they can remember from the preview (3-5 minutes). Encourage them to group ideas together for meaning, as well as recording individual names, words, numbers, etc.

D.) Then, ask students to study-read the selection 7-10 minutes). They can take notes if they choose to do so. Tell them they will be responsible for the understanding of the material.

E.) Have students (without selection and without using notes) answer ten multiple choice or short questions which you will need to devise with your own material (7-10 minutes). [In making the questions, vary difficulty and task, with some factual, others definition, main idea, and drawing conclusions.]

F.) For the last activity, assign students to write a summary of the material read -- without notes or selection (7-10 minutes).

III. Additional Guidelines:

A.) Assign a reasonable time limit for each activity. The preview time is the only one which should be strictly adhered to. Try not to "rush" students, so that they feel frustrated with this assessment.

B.) All writing for this is to be done from memory. Students may use own paper and should label selections carefully.

C.) This informal assessment can be given in a pre and post situation. The procedure should remain constant with the pre and the post measures, and the selections should be similar in difficulty of concept load and readability level. The first measure (pre) should be administered, followed by instruction of and student practice with study/ reading skills (sections 8 & 9 in this manual), and concluded with second measure (post). The criteria for grading both the pre and the post should be parallel.

D.) The assessment can be administered one time only, either before instruction to see what needs to be emphasized, or after instruction of study/ reading skills to evaluate student performance in that area.

E.) Points can also be assigned in this assessment. There are three written products to evaluate and a composite score of 25 points can be assigned (5-preview recitation, 10-comprehension questions, 10-summary). Using 25 total points eases the conversion to percentage scores for data recording.

F.) This assessment can be added to, to fit your needs. The tasks involved of reading and writing from memory, previewing, summarizing, etc. are important study/reading skills for the vocational student.

SECTION 4
INTRODUCTION TO THE GUIDE

READING THE VOCATIONAL TEXT/SKILLS PRESENTATION

Purpose:

This vocational staff development guide is designed to offer ideas and procedures for integrating reading skills with the occupational content of health related careers. To effectively read and understand the materials in this field, students need reading skill instruction and practice. There are two important concepts in teaching reading skills -- the introduction of technique and the opportunity for practice. As teachers, you can help provide this for your students by using the following suggested techniques and practice activities in your classroom.

Organization:

The following sections present important content reading skills and suggested instructional procedures. Only those skills particularly relevant to vocational texts have been included. And, each skill has been divided into segments requiring approximately 5-20 minutes of class time for introduction and for practice. Actually, this will not be additional work for you and your students. Since you will be using the content information to be learned, it will serve as a different method for learning it. Any suggested activities can be utilized as homework with the text assignments you would normally require at that point in your course. Since students must give careful attention to their

text in order to complete the reading skill assignment, they will have the opportunity to "work with" the content material and to learn and understand it better.

Each section introduces a skill and uses a variety of vocational examples to clarify it. Given exercises provide opportunity for the application of the skill and the mastering of it. The explanations and exercises are given to you as vocational teachers, and can be adapted and used with your students. Some changes may be necessary to fit your particular needs.

Following the individual skill discussions is a section called "Suggested Reinforcement Activities/Textbook." Here, each skill can be applied to your course textbook and supplementary reading materials. With this, you will locate skill practice examples within the text for use with your students; these same activities can in turn be assigned to your students for skill practice. This second application accomplishes three purposes:

1) It allows you to locate examples and sample exercises that you can use in your classroom, which will reduce preparation time;
2) It enables you to arrange skill instruction suitable to your text; and
3) It gives you an additional practice opportunity, and with the same materials your students will use.

At the end of each section are additional suggestions for teaching the new skills.

SECTION 5
DEVELOPING VOCABULARY SKILLS

DEVELOPING VOCABULARY SKILLS

To better understand the field of health careers the student must know the specialized technical vocabulary. Without understanding of "health-related" words, the student cannot gain enough information from the reading material. Since complete and rapid comprehension of this content vocabulary is critically important, most textbook authors have purposely provided definitions and other aids (varied type, contextual clues, etc.). Five of these aids are discussed on the following pages: formal definition, synonyms, inferential clues, illustrations, and glossaries.

Contextual Analysis

A practical way to build technical vocabulary is through contextual analysis -- learning the meaning of a word through its use in a sentence. Usually the author will define a technical term the first time it is used. From then on the student must remember it and recognize it as it is used in context. "Clues" within the sentences become important in learning and in remembering the necessary occupational vocabulary; they are the bits of information which help you arrive at the meaning. The following discussion of contextual analysis includes formal definition, synonyms and inferential clues.

A. Formal Definitions

Often an author will define an important technical term in the sentence that introduces it.

Example: The majority of organisms are aerobic; that is, they require oxygen to release the energy needed for life functions. (Davis, 1969, 125)

Term	Definition
aerobic	that which requires oxygen

Clue words tell the reader that a definition is included in the sentence. The clue words in this example are "that is." Other clue words which the author might use are: is, means, are, is referred to, is called, and is defined as.

Exercise A: Practice this vocabulary skill by locating the technical term and its definition in each of the following items. Remember that a technical term is a word specific to the occupation and it may include one word or several.

1. The dental explorer is a hand instrument that is used primarily as a probe to examine the less accessible areas of the teeth. (Chasteen, 1975, 110)

Term	Definition
_____	_____
	_____

2. At one time the photographic plate exposed by "X" radiation was referred to as the shadow graph, and later as the skiagraph. (Simon, 1973, 119)

Term	Definition
_____	_____
	_____

3. All of the foundation tissues which surround the teeth make up the periodontium. (Wheeler, 1969, 1)

Term	Definition
_____	_____
	_____

4. Organisms not only enter the tissue, but when infected tissue is manipulated, the organisms may enter the blood stream without producing symptoms or tissue damage. Such a state is bacteremia. When the presence of organisms in the blood stream is accompanied by symptoms, such as chills and fever, the process is septicemia. When pyogenic organisms are spread by the blood to produce abscesses in many areas, the process is pyemia. Toxins produced by microorganisms may be transported by the blood to produce injury to specific tissues and is termed toxemia. (Kerr & Ash, 1978, 84)

	Term	Definition
1.	_____	_____
2.	_____	_____
3.	_____	_____
4.	_____	_____

B. Synonyms

As an alternative to a formal definition, health-related occupational literature may clarify a technical term in the context by the use of a synonym. A synonym is a word or words which are similar in meaning to another word. The synonym may be enclosed in commas or parentheses directly following the term, or separated from the term by the word "or."

Example: Most living organisms need an oxygen supply to live, but there are some organisms that do not; they are called anaerobic (without oxygen). (Wood & Rambo, 1977, 39)

Term	Synonym
anaerobic	without oxygen

Exercise B: Locate the term and the synonym in each of the given paragraphs.

1. It nourishes the dentin and influences its deposition as well as the configuration (shape) of the tooth's root. (Simon, 1973, 99)

Term	Synonym
_____	_____

2. Present in the fluid are PMNLS and various serum components including immunoglobulins (antibodies). (Kerr & Ash, 1978, 242)

Term	Synonym
_____	_____

3. One of the most obvious signs of a respiratory problem is difficulty in breathing, or dyspnea, which may be categorized into several classifications. (Thompson & Rosdahl, 1973, 298)

Term	Synonym
_____	_____

4. Today in the operating room, we practice asepsis (the use of sterile equipment) and antisepsis (use of materials that sterilize). (Simon, 1973, 190)

Term	Synonym
a. _____	_____
b. _____	_____

C. Inferential Clues

Sometimes an author makes the meaning of a word clear, but doesn't actually define it. Also, as mentioned before, a technical term may be defined once early in the book, and then used later without definition. In both cases, the reader must use all the clues in the surrounding sentences (the context) to determine meaning. Students reading the following excerpt might not know the word "caustic." However, looking carefully at the contextual clues will help them to arrive at meaning. In this excerpt the useful clues are underlined; students finding these aids could determine the meaning of "caustic" as "dangerous and harmful."

Example: All chemicals in use should be labeled and instructions for their use should be carefully read and understood before handling. Chemicals can be very caustic and result in damage to the tissues. They would NOT be used on an open wound. (Atkinson, 1976, 67)

Exercise C: Read the following three selections and then briefly list the clues which would help the reader analyze the meaning or partial meaning of the term given.

1. The preventive treatment for bedsores is most important. Bedsores are caused by pressure on the parts of the body that are not covered by pads of fat or other tissues thereby causing a break in the skin and destruction of the tissues beneath it. The skin is more likely to break down if the area is continually moist or is not clean. In addition, rest in bed affects the circulation and increases the pressure on the bony prominences of the

body, such as the spine, the shoulder blades, and the elbows. The dangers are increased if a patient must lie in one position or if he has a cast or splints or a disease condition that affects the circulation. As soon as a break in the skin occurs, the way is open to infection. (Thompson & Rosdahl, 1973, 264)

a. Term: Bedsores

b. Clues which could help reader arrive at meaning:

c. Inferred definition

2. Sedation is used for the dental patient to relieve apprehension and fear. The techniques and drugs used do not render the patients unconscious, and their protective reflexes remain intact. The patients, at proper levels of administration, will respond to commands by the dentist and assistant and are able to cough, swallow, breath, and maintain all physiologic functions at reduced levels. (Richardson & Barton, 1978, 453)

a. Term: Sedation

b. Clues which could help reader arrive at meaning:

c. Inferred definition:

3. In centric occlusion lines of force brought to bear upon the fixed base or maxillary arch by the movable or mandibular arch are equalized and absorbed by the mutual aid of all the teeth. The entire dental mechanism is designed to cooperate with the design of,

and to achieve finally, centric occlusion as the ultimate terminal in function. (Wheeler, 1969, 131)

a. Term: centric occlusion

b. Clues which could help reader arrive at meaning:

c. Inferred definition:

Illustrations

A common type of definition in an occupational text is the illustration. Unfortunately, students often skip over the illustrations when they are reading -- assuming the printed words are more important. An initial task for the instructor is to emphasize to the students the need for immediate study of the designated figure whenever it is mentioned in the content of the text (Example: See Figure 8-2). The illustration will help them to visually understand the technical term to be learned. With repeated practice students will later apply the visual definition automatically to the term in context.

Example: Notice the way in which this illustration defines the term that is explained in the text.

This system is based on the relationship of the mesiobuccal cusp of the upper first molar as it occludes with the buccal groove of the lower first molar (Figure 1-19). In class I (normal occlusion), note that the arrow

on the mesiobuccal cusp of the upper first molar lines up perfectly with the arrow in the buccal groove of the lower first molar.
(Simon 1973, 23)

Fig. 1–19. Class I: Normal occlusion.

(Simon 1973, 23)

Pg.# terms	Pg.# Ill.	Terms
22	23	normal occlusion

Exercise D: Using each of the following illustrations and accompanying content material, list the occupational terms that are explained.

1. Unfortunately, burs, stones, rubber dam clamps, matrix bands, copper bands, and temporary crowns are too small to stay in the autoclave tray and thus require special treatment. The Ultrasonic Cleaner* is very effective for removing debris from the flutes of burs and other tiny crevices. The method involves vibration; use of a chemical solution of Zephiran chloride adds disinfection to the cleanliness. The small items are cleaned together in a perforated bur basket (Figure 7-51). The bur basket, which has a snug-fitting cover, is laid on its side in the tray of the Ultrasonic Cleaner (Figure 7-52).
(Simon, 1973, 191)

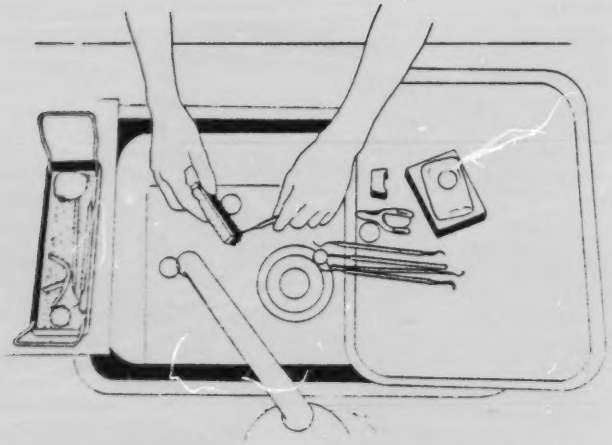


Fig. 7–50. Instruments are washed and rinsed before sterilization.

(Simon, 1973, 191)

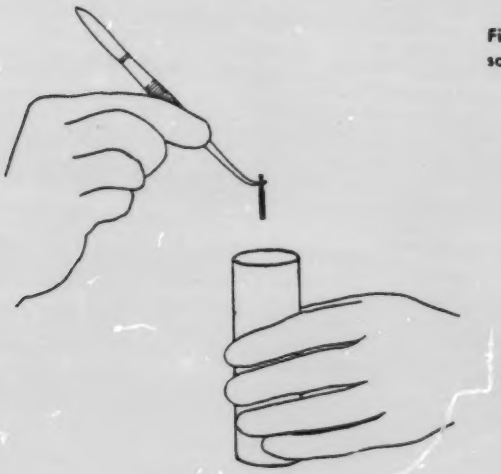


Fig. 7–51. Perforated bur basket holds small items.

Fig. 7–52. Bur basket is laid on its side in Ultrasonic cleaner.

(Simon, 1973, 191)

Pg.# terms	Pg.# Ill.	Terms

2. In addition to acidogenic bacteria that cause decalcification, proteolytic organisms are present that elaborate proteolytic enzymes which destroy the organic material of the tubules and the dentin matrix.

   Organisms may produce localized widening of the tubules and extend the carious process laterally through the side branches of the tubules and produce destruction of dentin matrix in a leaf-like pattern at right angles to the direction of the dentinal tubules (Figure 107). Organisms collect in the clefts and extend the proteolytic destruction in all directions. The destruction of the dentin matrix results in cavitation of the dentin. Caries of dentin is, thus, a process of demineralization and proteolytic disintegration and depends on the action of two types of microorganisms. (Kerr & Ash, 1978, 197)

Figure 10: Illustrations

Figure 107. *Caries of dentin.* Large dark areas represent colonies of organisms in areas of destruction of dentin matrix.

(Kerr & Ash, 1978, 197)

Pg.# terms	Pg.# Ill.	Term

3. Some of the many different motions that the body can perform have definite names so far as function is concerned. Flexion decreases the angle between 2 bones or bends a part on itself, as in bending the elbow; extension, or straightening, is the opposite. Abduction is movement away from the midplane of the body; adduction, the opposite, is movement toward the midplane. If you hold your arm out straight and then move it around in a circle, all these movements are combined; the resulting motion is circumduction. A different kind of motion is rotation, which is twisting one part with respect to that which joins it, but without changing the angle between the two. An example of rotation is twisting the head in the familiar gesture of saying "No." (Thompson & Rosdahl, 1973, 94).

Figure 11: Illustrations

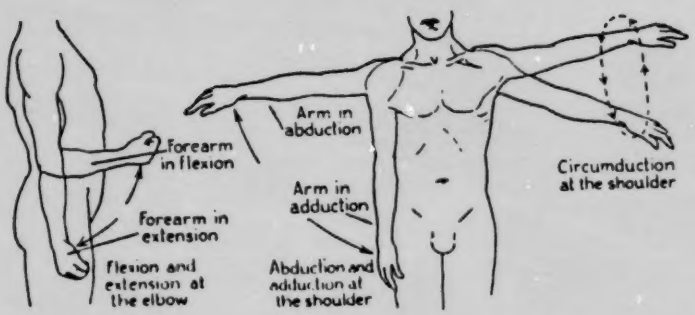

Arm in abduction
Forearm in flexion
Arm in adduction
Circumduction at the shoulder
Forearm in extension
Flexion and extension at the elbow
Abduction and adduction at the shoulder

Figure 13-5. Movement types. (Baiflif and Kimmel: Structure and Function of the Human Body. Philadelphia, Lippincott)

(Thompson & Rosdahl, 1973, 94)

Pg.# terms	Pg.# Ill.	Terms

Glossaries

Many current vocational texts include glossaries (listings of important vocabulary) at the end of the chapter or at the conclusion of the book. The teacher's task is to stress the need for the student to use this vocabulary aid. During much of the course, students should be required to review the glossary before beginning a new chapter. Students would either review the one at the end of the new chapter or those words indicated by the teacher in the glossary in the back of the book. As students read the chapter and encounter a new word that is defined in the glossary, they can note it on notepaper, along with the definition. This can be included with the notes on that particular chapter -- either within the class notes or on a separate piece of paper.

Exercise E: Suggested Reinforcement Activities/Textbook

Select an introductory chapter from the vocational text you use in your teaching. Look for the vocabulary aids just introduced and discussed.

This will help you to better understand the skill and its major parts and will show you examples to use when teaching this skill. These same activities can be assigned to your students for practice and reinforcement of the vocabulary skills.

I. Contextual Analysis

A. Formal Definitions

	Pg.#	Term	Clue Word	Definition
1.				
2.				
3.				
4.				
5.				

B. Synonyms

	Pg.#	Term	Synonym
1.			
2.			
3.			
4.			
5.			

C. Inferential Clues

	Pg.#	Term	Definition	Clues (Words, Phrases)
1.				
2.				
3.				
4.				
5.				

II. Illustrations

	Ill.#	Terms defined by illustration
1.		
2.		
3.		
4.		
5.		

III. Glossary

	Pg.#	Terms found in glossary for this chapter
1.		
2.		
3.		
4.		
5.		

Procedures: Teaching Students Improved Vocabulary Skills

Vocabulary skills should be introduced and practiced throughout the course. Instruction of new techniques and discussion of examples will require only 15-20 minutes. Giving students the chance to recontact the word is very important since this is what helps the new occupational term to remain in a student's vocabulary. A new word is easily forgotten if it is not "seen again." These terms should be recontacted over a period of time. Suggested activities for recontact are:

1) Teacher reviewing students orally in class.
2) Students reviewing each other orally.

3) Teacher assigning students to write a paragraph using five of the technical terms recently or previously learned.

4) Students making flash cards for quick review, with word on the front and definition on the back.

5) Teacher using a CLOZE paragraph where students must fill in appropriate occupational terms.

Additionally, students should be encouraged to keep a collective list of content vocabulary with definitions and page location in text per chapter. With this, students can recognize words to be learned and see the relationship the words have to each other in that particular chapter. They will have a definite guideline for words to be learned. This activity can be classwork, be assigned as homework, and be evaluated for credit.

In selecting paragraphs and specific examples to teach the vocabulary skills, begin simple and increase to the longer and the more difficult. Students first need to gain confidence in the particular vocabulary skill. This can be done with both the textbook materials and the manufacturers' materials.

The instruction of vocabulary skills would be spread throughout the course. Introduce each vocabulary technique and give opportunity for practice. Emphasize the "occupational" terms since the learning of them is vitally important to the understanding of the written material whether text or manufacturers'.

SECTION 6
DEVELOPING COMPREHENSION SKILLS:
THE PARAGRAPH

DEVELOPING COMPREHENSION SKILLS/THE PARAGRAPH

Understanding paragraph organization is an important reading skill for the vocational student. A paragraph has three major components:

1) the subject (what is being talked about)

2) the main idea (the most important information about the subject)

3) the supportive information (details that make the information clearer)

Of these, the main idea is the most crucial, for the key points of a chapter or article are simply selected main ideas from component paragraphs.

Look at the following paragraph. Search for the subject, the main idea, and the supporting details.

> Each patient in the dental office should, by standard procedure, be required to answer certain questions relative to medical history. If the patient is to undergo any operative procedure which will require the use of a local or general anesthetic, there is absolutely no excuse for this information not being available. If the patient is not an adult, the information should be obtained from the parents prior to performing the procedures. (Richardson & Barton, 1978, 422)

The subject here is "medical history of dental patients," because parts of the paragraph refer to that topic. The main idea, or collection of the most important information is: "Dental patients of all ages should be interviewed regarding medical history before any dental procedures are performed." The rest of the paragraph provides supportive information, such as: "If the patient is to undergo any operative procedure which will . . ." and "If the patient is not an adult . . ."

Paragraph Subject

The key to finding the subject of the paragraph is locating the one topic to which everything else in the paragraph is related. A paragraph usually discusses one small aspect of a larger topic; therefore, the paragraph subject must not be too general. It must identify the specific topic being discussed. At the same time, the subject cannot be too specific, as it must cover the range of the ideas presented in the paragraph.

Example: Read the following paragraph and look for its subject.

> Painted and chrome-plated surfaces of the dental chair are to be wiped daily with a moistened chamois skin. Occasionally, mild soap with a damp cloth may be used to remove stubborn soiled areas. For polishing and preserving the surface luster, apply a wax preparation made specifically for dental units and chairs or one of the self-cleaning automobile paste waxes. (Anderson, 1974, 115)

In this example students might select "cleaning the dental office" as the subject. This is much too general. Conversely, a chosen subject of "how to clean soiled areas of the chair" would be too specific. The correct choice of subject is "cleaning painted and plated surfaces of the dental chair."

Exercise A:

Determine the subject of the following paragraphs. Be certain that all paragraph information relates to that subject.

1) The gluteal muscles form the seat or the rump. They are thick muscles on which you sit. They function to extend and to hyperextend the hip joint. Several strong, broad muscles attached to the pelvis and the thigh bone produce the flexion and adduction of the hip. The gluteals, hamstrings, and quadriceps are used in walking and other

movements. When you are standing, they help to keep the femur, or thighbone, erect on the shinbone (tibia), which is the large bone of the lower leg. (Wood & Rambo, 1977, 70)

Subject: _____

2) Gold foil is pure 24 karat gold and is processed by methods altogether different from those used to obtain other golds used in dentistry. It is the only metal that will or can be melted into a solid mass gold, it will adhere only after it has been annealed, and the density of properly condensed gold foil is very high. (Anderson, 1974, 192)

Subject: _____

3) The majority of dental patients have very little contact with the dentist or the dental staff outside the office. Consequently dentists frequently have little idea of the image they exhibit to patients. How people feel about dentists as health-affairs people is important to know. Information in this area may provide dentists with the key to open the doors of comprehensive patient care which otherwise might be permanently closed. It may also give them cause to improve their professional image. (Richardson & Barton, 1978, 71)

Subject: _____

Paragraph Main Idea

The main idea of a paragraph includes the most important information of that paragraph. The following four guidelines can help in its location:

1. If the paragraph includes the definition of a term, that term might be part of the subject. The definition might be part of the main idea.

2. If there are examples, these may illustrate all or part of the main idea.

3. If a key word or phrase is repeated, it might be part of the subject or main idea.

4. Highlighted words might be part of the subject or main idea.

Note that the word "might" is used in each instance. These guidelines can point toward possible main ideas, but they cannot automatically select the right one.

The main idea is not necessarily the topic sentence. It is a statement which includes all the most important ideas of the paragraph, and they may be contained throughout the paragraph. Looking effectively for this "framework" requires much practice. Therefore, writing a statment of main idea is helpful, and recommended for teaching this skill of main idea. The following procedure should be used when making a statement of main idea:

1. Look for the most important ideas in the paragraph.
2. Write them in a statement in your own words.
3. Be brief and concise.

Example: The most troublesome, if not dangerous, side-effect of the antihistamines in general is drowsiness. For this reason they should not be taken when working around machinery, when driving late at night, or at any other time when drowsiness could be hazardous. The sedative effort of these agents is greatly increased when they are combined with alcohol, tranquilizers, hypnotics, narcotics, and many antihypertensive medications; thus the combination of these agents is to be avoided. (Asperheim, 1975, 96)

A statement of main idea could be:

Antihistamines can cause drowsiness, which can be especially when they are combined with certain drugs and alcohol.

Exercise B:

Look at the following four paragraphs. First ask yourself what the paragraph is about (the subject). Then look for the main idea using the suggested guidelines. Note which guidelines are most helpful in each case. Finally, make a statement of main idea with aid of the suggested procedure. (It may be helpful to underline words and phrases which pertain to the important information.)

1) For a complete dental oral diagnosis, a series of radiographs is extremely important. Many systemic and oral diseases can be detected on radiographs before they are clinically apparent. For example, decay between the teeth can be detected much earlier and more accurately with the aid of radiographs. In addition, abscesses (infection at the root tip), bone diseases, periodontal disease and the eruption of permanent teeth can be detected with the use of radiographs.

   A. Subject: _____

   B. Statement of Main Idea: (Either write here or underline)

   _____

   _____

2) Illness is always a threat to adjustment. It interferes with the usual pattern of living, is very likely to be accompanied by discomfort, may involve doubt as to the outcome, and often creates financial problems. Patients and their families react to illness according to the degree of threat it represents. Adjustment is always poorer during illness. Sometimes behavior patterns which are not typical of a person appear during illness. Someone who is usually easy to please, for example, may be very difficult to please during an illness. A person who is usually quite well adjusted may show signs of poor adjustment when he is a patient. (Milliken, 1974, 97)

A. Subject: _____

B. Statement of Main Idea: _____

_____

_____

3) Patients with diabetes have difficulties using the sugars in food. Sugar is used by the body for energy. Insulin is a normal hormone produced by the endocrine cells called the islets of Langerhans, located in the pancreas. This hormone assists in oxidizing (burning) the sugars in the blood and maintaining the normal limits of blood sugar. However, in the diabetic patient there is less insulin - or none at all - manufactured by the body to aid in the process of burning sugars. A medication (insulin administered by hypodermic or an oral synthetic insulin) is given to the patient to assist him in using the sugars from foods. (Wood & Rambo, 1977, 313)

A. Subject: _____

B. Statement of Main Idea: _____

_____

_____

4) The gingiva is the mucous membrane covering the alveolar processes and encircling the necks of the teeth. It aids in the attachment of the teeth and in protecting the teeth against injuries and against bacterial invasion. It is highly vascular and contains nerves for sensation. It withstands the forces of mastication, an ability that is increased by keratinization or cornification, a process in which the cells produce a very insoluble protein for protection of its surface. Healthy gingival tissue is pale pink, firm and resilient, and it fills the interdental spaces to help prevent the accumulation of debris.

A. Subject: _____

B. Statement of Main Idea: _____

_____

_____

Paragraph Supportive Information

Authors use supporting ideas to carry out their main ideas. They may present these supporting ideas in several ways: giving particular cases, using a restatement, giving reasons, and making comparisons and contrasts (Blake, 1973, 23). Supportive information helps us to understand the meaning of the main idea, since it provides explanation. Each supporting idea must refer to that main idea.

Author's clues help us to locate supporting ideas. Examples of these clues are: "for example," "for instance," "that is," "in other words," "for these reasons," and "consequently."

Example: Review this paragraph again, and look now for the supporting ideas.

> The most troublesome, if not dangerous, side-effect of the antihistamines in general is drowsiness. For this reason, they should not be taken when working around machinery, when driving late at night, or at any other time when drowsiness could be hazardous. The sedative effort of these agents is greatly increased when they are combined with alcohol, tranquilizers, hypnotics, narcotics, and many antihypertensive medications; thus the combination of these agents is to be avoided. (Asperheim, 1975, 96)

A. Restatement of Main Idea:

Antihistamines can cause drowsiness, which can be hazardous, especially when they are combined with certain drugs and alcohol.

B. Supporting Ideas:

1) They should not be taken when working around machinery, when driving late at night
Clue words - "For this reason"

2) The sedative effort is greatly increased when they are combined with alcohol, tranquilizers, hypnotics, narcotics, and many antihypertensive medications

Notice that the supporting ideas lend explanation and example to the information in the main idea.

Exercise C:

Turn back to the paragraphs in Exercise G in which you were to make statements of main idea. Use the main idea of each to help you locate supporting ideas. Remember that each supporting idea must relate to that main idea. (This can help you to determine the accuracy of your main idea.) For each of the four paragraphs record the main idea and the supporting ideas below.

1) Main Idea: _____

_____

Supporting Ideas:

1.

2.

3.

2) Main Idea: _____

_____

Supporting Ideas:

1.

2.

3.

3) Main Idea: _____

_____

Supporting Ideas:

1.

2.

3.

4) Main Idea: _____

_____

Supporting Ideas:

1.

2.

3.

Paragraph Comprehension and Illustrations

Paragraph comprehension can be reinforced by the proper use of illustrative material. In health-related literature processes are often illustrated by sequential diagrams. Students must learn to "read" the diagram in its proper sequence and to relate each phase to the appropriate portion of the prose (text material).

At other times non-sequential illustrations are used to highlight the important concepts (usually the main idea) presented in the prose that do not describe a process.

A. Sequential Illustrations

Figures 12 and 13 utilize step-by-step illustrations to clarify the text material. Selections such as these can be

duplicated for student practice; students can integrate the text and the illustration by drawing lines from the words in the material to the corresponding phase of the diagram.

To obtain greater accuracy, many prosthodontists obtain the preliminary impression and then construct a stone cast. A tray of acrylic resin or similar material is constructed on the cast. This tray is then used for obtaining the zinc oxide-eugenol paste impression. The technic is illustrated in Figure 7-3. (Phillips, 1973, 99)

Figure 12: Illustrations

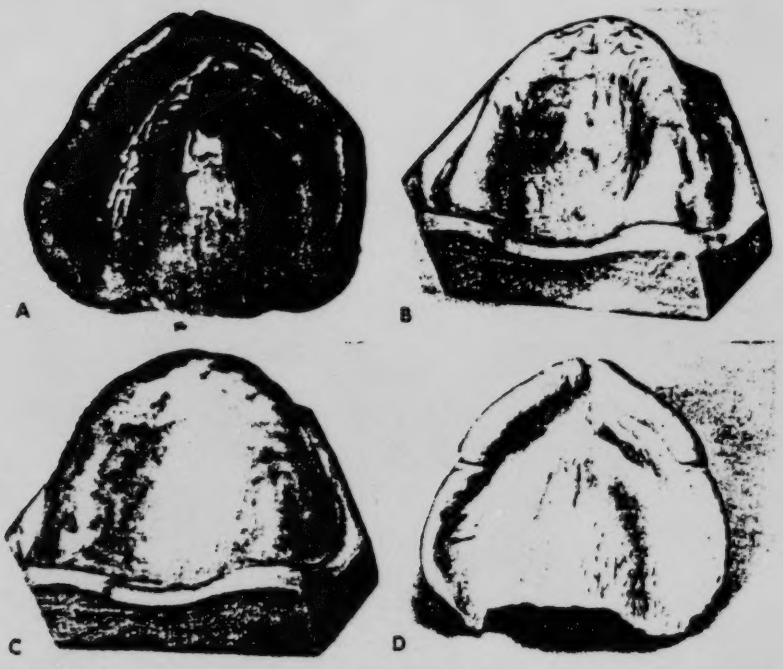


FIGURE 7-3. Steps involved in preparing secondary impressions in the construction of a denture. *A*, primary compound impression; *B*, cast made from the primary compound impression; *C*, plastic tray fabricated over the cast; *D*, secondary impression of zinc oxide-eugenol paste obtained in the plastic tray.

Figure 13: Illustrations

A normal erythrocyte is a non-nucleated round cell that originates in the bone marrow from a nucleated cell which is usually called a rubriblast. Opinions vary as to the life span of an erythrocyte, but the mean is 80 to 120 days. Nonfunctioning cells undergo fragmentation and are then removed from the blood stream by the phagocytic cells of the reticulo- endothelial system. The phagocytic cells of the liver, spleen, bone marrow, and subcutaneous tissue carry on this process. Red blood cells carry oxygen from the lungs to the body cells and carbon dioxide from the body cells to the lungs for elimination. When they lose their ability to absorb oxygen and carbon dioxide, they become nonfunctioning (Fig. 6-8). (Woosley & Cuviello, 1977, 36 & 37)

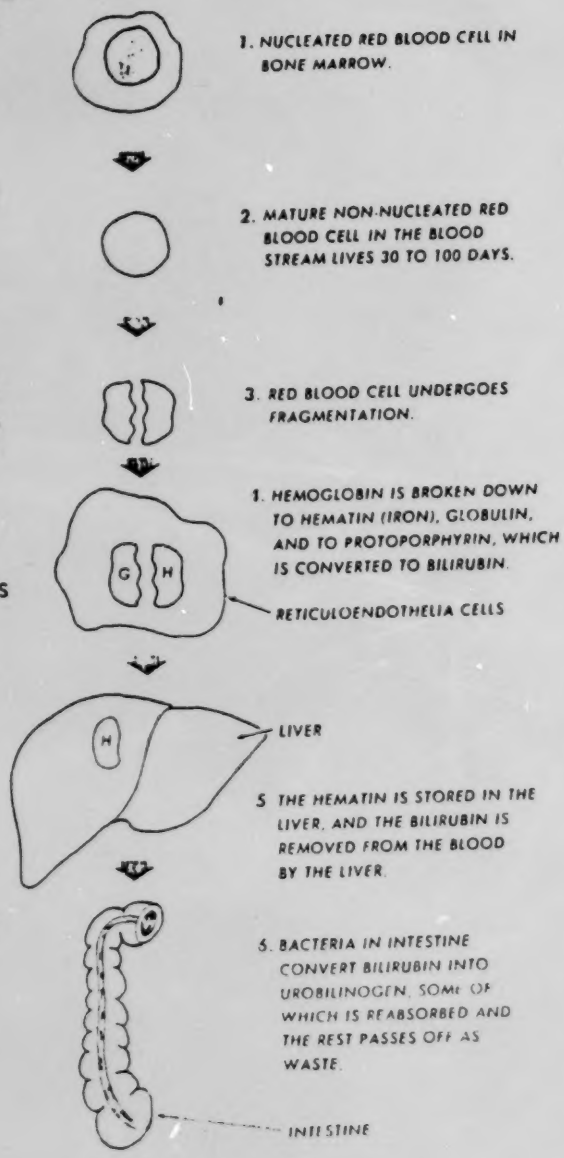

1. NUCLEATED RED BLOOD CELL IN BONE MARROW.
2. MATURE NON-NUCLEATED RED BLOOD CELL IN THE BLOOD STREAM LIVES 30 TO 100 DAYS.
3. RED BLOOD CELL UNDERGOES FRAGMENTATION.
1. HEMOGLOBIN IS BROKEN DOWN TO HEMATIN (IRON), GLOBULIN, AND TO PROTOPORPHYRIN, WHICH IS CONVERTED TO BILIRUBIN.
G
H
RETICULOENDOTHELIA CELLS
H
LIVER
5 THE HEMATIN IS STORED IN THE LIVER, AND THE BILIRUBIN IS REMOVED FROM THE BLOOD BY THE LIVER.
5. BACTERIA IN INTESTINE CONVERT BILIRUBIN INTO UROBILINOGEN, SOME OF WHICH IS REABSORBED AND THE REST PASSES OFF AS WASTE.
INTESTINE

Fig. 6-8. Life cycle of a red blood cell.

B. Non-sequential Illustrations

Figure 14 uses illustrations that are not sequential to clarify text material. In this case, a process is not described. Again, students should relate each part of the diagram with the appropriate phrases in the paragraph by drawing connecting lines.

Let us study five different film mounts used for a full-mouth survey of adults, pedodontic patients, small children, edentulous patients and for the Panorex. A group of dentists in a government clinic decided on the overall size, arrangement, number of windows, and film size for these specially designed mounts. Lines are provided at the top of each film mount for the patient's name and date of the x-rays, but they are omitted from this and the suceeding film mounts to save space.

The adult survey film mount (Figure 5-9) has 19 windows, of which 8 receive the Rinn #2 film and 11 receive the Rinn #1 film.

The pedodontic survey film mount (Figure 5-10) has 13 windows, of which 4 receive the Rinn #2 film and 9 receive the Rinn #1 film.

All 12 windows of the deciduous tooth film mount (Figure 5-11) receive the Rinn 00 film.
(Simon, 1973, 120)

Figure 14: Illustrations

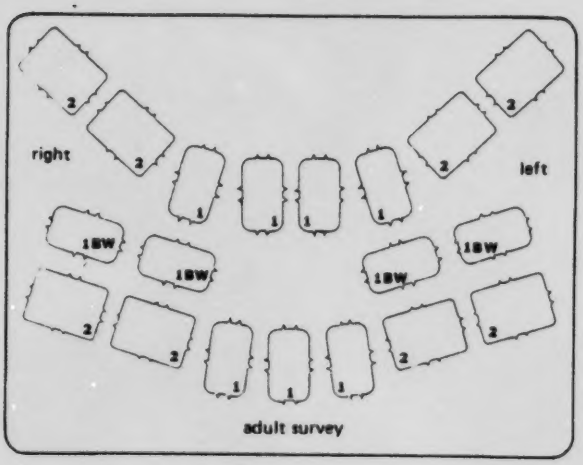


Fig. 5–9. Adult film mount.

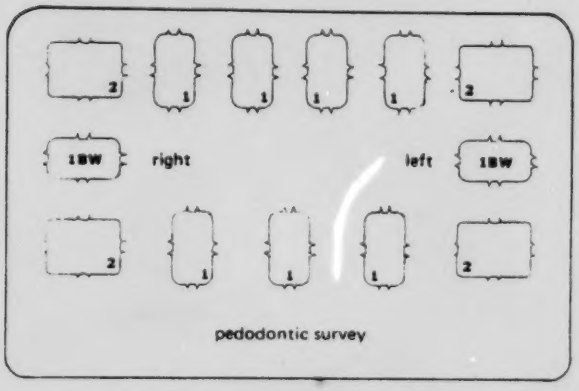
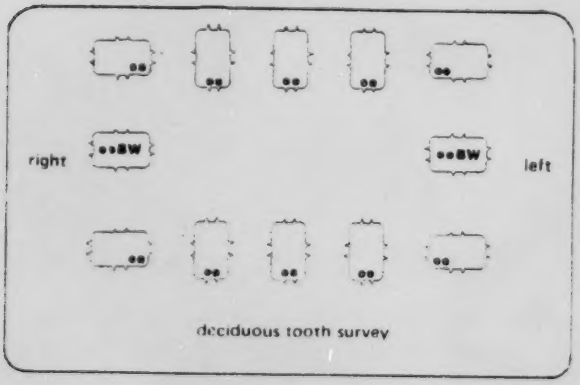


Fig. 5–10. Pedodontic film mount.

Fig. 5–11. Deciduous tooth film mount.



Exercise D: Suggested Reinforcement Activities/Textbook

1) Select 4 paragraphs of average length, each from a different chapter of your textbook. Identify the subject in each.

	Page #	Column #	Paragraph #	Subject of Paragraph
1.				
2.				
3.				
4.				

2) Select four paragraphs from your textbook, each from a different chapter. Identify the subject, and write a statement of main idea for each.

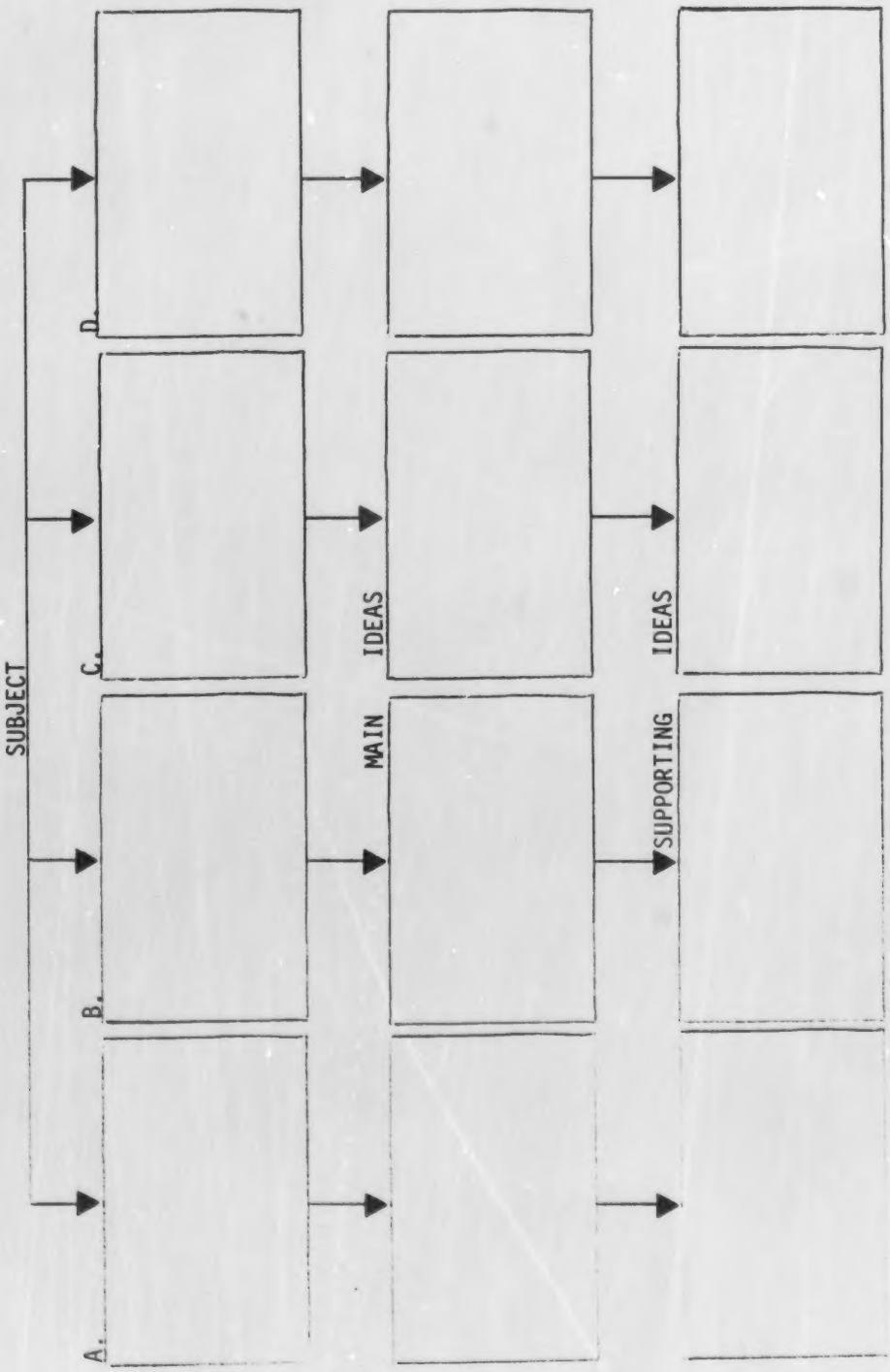
	Page #	Column #	Paragraph #	Subject	Statement of Main Idea
1.					
2.					
3.					
4.					

3) Next, choose four sequential paragraphs of a text chapter, Identify the subject and write a statement of main idea for each.

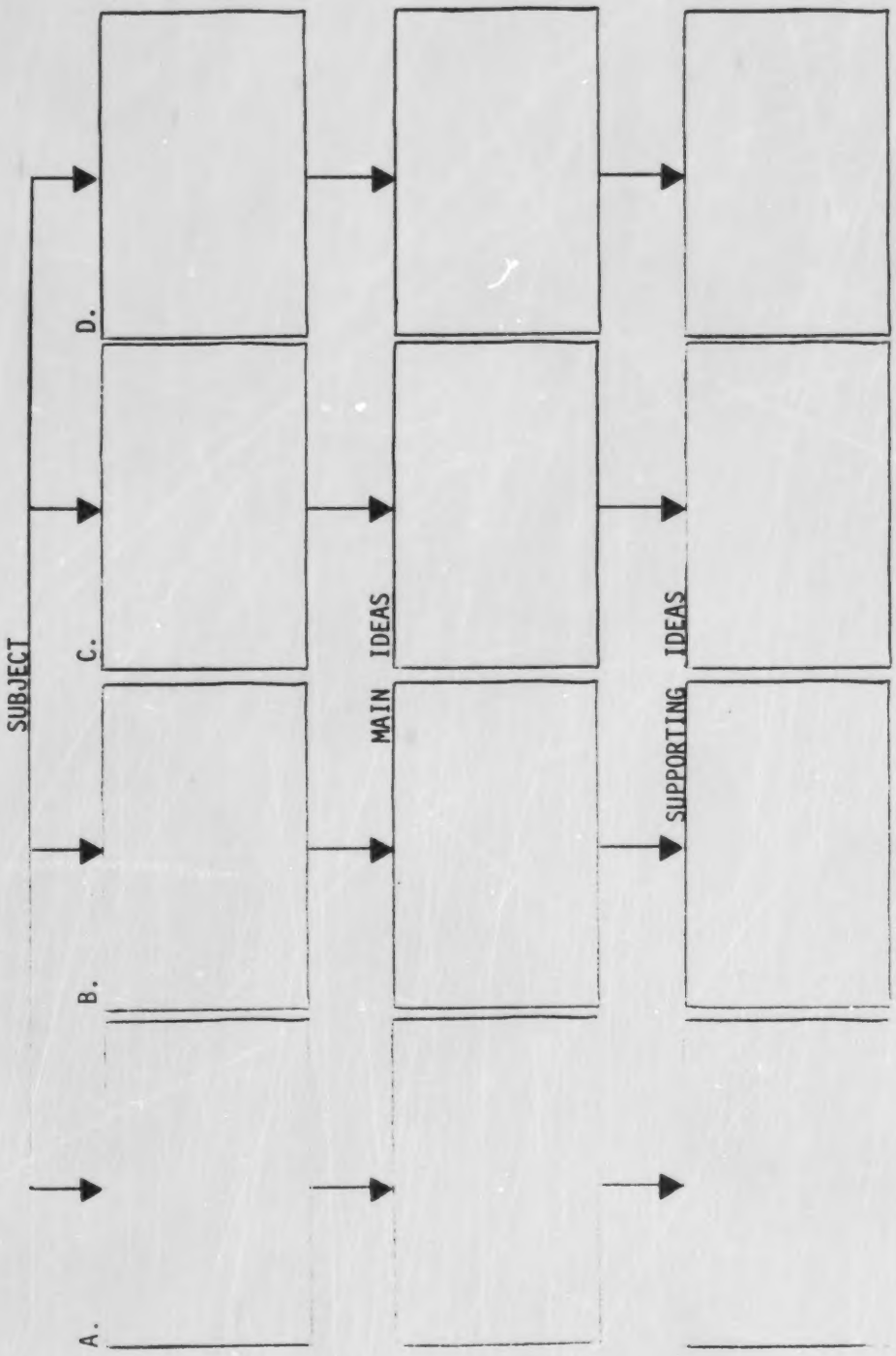
	Page #	Column #	Paragraph #	Subject	Statement of Main Idea
1.					
2.					
3.					
4.					
5.					

139

4) Take the same paragraphs selected for item #2 and find supporting ideas. Complete the following chart



5) Use the same paragraphs selected for item #3 and find supporting ideas. Complete the following chart.



6) Select four sequential and/or non-sequential diagrams that illustrate the main idea of a paragraph within the text material.

	Illustration Page #	Prose Page #	Subject
1.			
2.			
3.			
4.			

Procedures: Teaching Students to Better Understand the Paragraph

Understanding the paragraph is one of the most important and one of the most difficult reading skills the vocational instructor must teach. It is the basis of understanding what is read; it is definitely needed knowledge for the higher-level comprehension skills, which are necessary for health-related literature.

Recognizing the framework of the paragraph (the subject, the main idea, the supporting ideas) requires the ability to distinguish. Students need careful guidance in identifying the subject, and distinguishing among main idea information, supporting ideas, and material that is totally unimportant. It is necessary to introduce the material slowly and incrimentally, as was done here. Students need to be aware of the importance of their understanding the paragraph, so that they can exert maximum effort to this reading skill.

In your instruction, move slowly through the information. Three or more class sessions should be given to the introduction of each of the paragraph components, with assigned practice for outside of class. When the students show competence with the first component (the subject), move to main idea and introduce this gradually, presenting and practicing each of the four clues. With main idea, emphasize the concept of "what is the most important information the author is giving you in this paragraph." Discuss how to make a statement of main idea by using the suggested guidelines. The practice of writing the main idea will help to clarify this skill

and make it a usual reading behavior.

Then progress to the supporting ideas, discussing the different types and emphasizing the function of this component. Students should clearly understand that supporting ideas must relate to the main idea, and that they help to explain.

Practice with integrating text material and illustrations will be equally useful to your students. Health-related literature contains many illustrations and diagrams which help to explain the main points expressed in the prose. The visual reinforcement can be most beneficial.

Important Considerations:

A. Introduce paragraph components gradually over a period of time.

B. These skills need to be practiced frequently so the students can acquire competence with them.

C. In using text extractions for examples and assigned practice, begin short and build to longer selections. Also, begin easy and increase to more difficult material.

D. The paragraph you identified in "Suggested Reinforcement Activities" can be assigned for location of subject, main idea, and supporting ideas.

E. The activities in "Suggested Reinforcement Activities" are effective practice for the paragraph skills and can be assigned to your students as well.

SECTION 7

DEVELOPING COMPREHENSION SKILLS: RECOGNIZING AND RECORDING COMPLEX INFORMATION

DEVELOPING COMPREHENSION SKILLS/ RECOGNIZING AND RECORDING COMPLEX INFORMATION

In health-related literature there are large amounts of new information to be learned. Within this information there are logical relationships--classification, comparison and causality. Recognizing these relationships and learning how to record them effeciently for study can be beneficial to the understanding of the material.

The nature of these relationships should be established. Classification in its simplest form is listing. Comparison is the process of finding likenesses and differences. Causality, or cause-effect, is that which results from something else. These will be further discussed, with accompanying examples.

Classification

Classification is a listing of information. The use of classification can be signaled by the following: a colon (:); numbers or letters; words such as "these include." At other times it is simply introduced by a statement: "there are three kinds of joints."

Information which includes classification can be recorded by simple listing if single items are given, or by outlining when items are more complex and require explanation.

Example:

A. Simple Listing

Less frequently, the patient may develop
1) parolites, 2) urinary retention, or

3) hiccups (singulties) during the post-operative period . . . (Wood & Rambo, 1977, 496)

For study purposes the student could record:
- Post operative period -- possible problems:
  1) parolites
  2) urinary retention
  3) hiccups

B. Outlining

Drugs Which Affect the Uterus

The uterus is a muscular organ with great power to expand or contract. The drugs which affect the uterus are those that increase or decrease this power.

Oxytocics. The drugs used to increase uterine contractions are called oxytocics. The commonly used ones are preparations of ergot and extracts from pituitary gland hormones.

Ergot is a dried portion of a fungus that grows on grain -- especially on rye. Preparations of ergot are used to promote the contraction of the uterus to its normal size after childbirth and to constrict the small blood vessels to prevent postpartum hemorrhage. Some preparations are:

Ergotrate: Given subcutaneously or intramuscularly immediately after delivery; the usual dose is 0.2 mg., which may be repeated every 4 hours for 6 doses after delivery. Tablets for oral administration are also available.

Methergine: Resembles ergotrate in its action, but is more powerful, has more prolonged effects, and is less likely to raise blood pressure. The usual dose in 0.2 mg. given by injection or by mouth.

Side-Effects. Possible side-effects of these drugs are nausea and vomiting, dizziness, headache and diarrhea, and abdominal cramps. These are most likely to occur after large doses of the drug are taken, such as in attempted abortion. Severe poisoning may cause gangrene, brain degeneration, and blindness.

> Posterior Pituitary Hormone Extracts. These preparations are given during childbirth to increase uterine contractions at the time of delivery; they may be given during a long labor when normal contractions fail to expel the fetus. They are also used to contract the uterus and reduce hemorrhage after the placenta is expelled. Obstetrical Pituitrin and Pitocin are commonly used preparations available in ampules. The first is given subcutaneously, the second intramuscularly. The usual dosage varies from 0.3 to 1 ml. They are rarely used in the first stage of labor. Patients receiving these drugs during labor must be watched closely, with frequent checks of blood pressure and fetal heart tones. Prolonged contractions of the uterus diminish the blood and the oxygen supply of the fetus. (Thompson & Rosdahl, 1973, 367-8)

An outline such as the following could be recorded by the student:

Drugs Which Affect the Uterus

I. Osytocics - increase uterine contraction

   A. Ergot preparations

      1. Use

         a. contract uterus after birth

         b. constrict blood vessels and prevent postpartum hemorrhage

      2. Kinds

         a. Ergotrate

         b. Methergate

      3. Side Effects

         a. after large doses: nausea, vomiting, dizziness, headache, diarrhea, abdominal cramps

         b. severe poisoning: gangrene, brain degeneration, blindness

B. Posterior Pituitary Hormone Extracts

1. Use

a. speed delivery (speed contractions)

b. reduce hemorrhage (postpartum)

2. Kinds

a. Obstetrical Pituitrin

b. Pitocin

3. Cautions

a. given during labor, must frequently check blood pressure and fetal heart tones (may reduce oxygen and blood to fetus)

II. Drugs to Decrease Uterine Contractions

etc.

Modified outline charts can also be constructed for the classification of complex information. Some students prefer the "visual grouping" of the charting procedure, as compared to the written outline. Notice the following example, extracted from Park, Ashman & Shelly (Figure 8), A Textbook for Dental Assistants (1975, 198).

Example:

Figure 15: Modified Outline Chart

CHARACTERISTIC	BENIGN TUMORS	MALIGNANT TUMORS
Structure and differentiation	Structure often typical of the tissue of origin	Structure a typical, i.e., differentiation imperfect
Mode of growth	Growth expansive, and a capsule is formed	Growth infiltrative as well as expansive so that encapsulation is absent
Rate of growth	Growth usually slow; mitotic figures scanty, and those present are normal	Growth may be rapid, with many abnormal mitotic figures
Progression of growth	Usually slowly progressive growth which may come to a standstill or retrogress	Growth rarely ceases; often rapid and usually progressive to a fatal termination
Metastasis	Absent	Frequently present

Exercise A: Classify the following information on a separate piece of paper. Constuct an outline or an outline chart to record the material which discusses impression materials.

Classification of Impression Materials

There are several ways by which impression materials can be classified. One way is according to the manner in which they harden. For example, plaster of paris hardens by chemical action, as do the impression pastes and the alginate and rubber impression materials to be discussed in subsequent chapter.

On the other hand, the impression compounds soften under heat and solidify when they are cooled, with no chemical change taking place. Such materials are, therefore, classified as thermoplastic substances. Although the reversible hydrocolloid materials to be described in Chapter 8 may not be classified strictly as thermoplastic materials, they are liquefied by heat, and they solidify, or gel, when they are cooled.

Another way to classify the dental impression materials is according to their uses in dentistry. As previously noted, an impression made with plaster of paris cannot be removed over undercuts without the impression being fractured. If an impression of teeth is made with impression compound, the compound flows when the impression is withdrawn over the undercuts, and the tooth form is not preserved with accuracy. The same is true with an impression made with the impression pastes. Although these three types of materials can be used with certain limitations for all types of impressions, they are best suited for obtaining impressions of edentulous mouths. Therefore, they may be classified as impression materials for use in complete denture prosthesis.

On the other hand, the elastic hydrocolloid impression materials are best used for obtaining an accurate reproduction of tooth form, including the undercuts and interproximal spaces. Although these materials can be employed for edentulous impressions, they are used most extensively in crown and bridge, partial denture, and operative dentistry when impressions of teeth are included. (Phillips, 1973, 83)

Comparison

While classification is commonly used in health-related literature, it is seldom used alone. Once elements of a topic have been classified into sub-topics, these sub-topics are usually compared. The textbook often provides comparison charts in which the topics to be compared are given along one axis and the features of comparison are given along the other. If a comparison chart does not accompany the text information, then a student can construct his own. It is important that the student understands the organization of this type of chart before he constructs his own. Use a chart such as the following as a model for review by students.

Example:

Figure 16: Comparison Chart

SUGAR CONTENT OF POPULAR FOODS

FOOD	APPROX. MEASURE	TSP of SUGAR
Coca Cola	6 oz.	5
Chocolate milk shake	8 oz.	14
Chocolate ice cream soda	Average size	11
Cinnamon bun with raisins	1 average	8
Jelly doughnut	1 average	7
Iced cup cake	1 medium	9
Peach ice cream	1 cup	15
Orange water ice	½ cup	19
Apple pie	1/6th of medium pie	14
Chocolate pudding	½ cup	9
Raisins	5/8 cup	17
Candy bar	Average	8
Fudge, plain	1" square	5
Jelly beans	10 square	4
Lollipop	1 medium	8

(Torres & Ehrlich, 1980, 367)

This comparison chart is relatively simplistic in which singular items are compared. Students should then be exposed to comparison of a more difficult nature in which ideas are compared. Note the following chart in Figure 17, taken from Chasteen (1975, 201).

Example:

Figure 17: Comparison Chart

The most common local irritants and their possible mechanisms of action on the soft gingival tissue.

LOCAL IRRITANTS

Irritant	Possible mechanism of action
Dental plaque	Chemical irritation due to bacterial toxins, enzymes, and breakdown products of epithelial cells
Calculus	Mechanical irritation due to the soft tissues rubbing on the coarse surface of the calculus, in addition to the chemical irritation of the calculus itself, which contains bacteria that produce toxic products
Overhanging restoration margins and porous filling materials	Mechanical rubbing of the soft tissue plus being an ideal place for bacterial plaque to form and chemically irritate the soft tissue
Food debris	Chemical irritation due to breakdown products of putrefying food and bacterial growth
Trauma from food	Mechanical irritation due to food being forced onto the delicate gingiva as a result of open contacts between teeth and poor contours of restorations
Mouth breathing	Excessive drying of soft mucosal tissue, resulting in dehydration of the cells and chronic irritation

(Chasten, 1975, 201)

Example: Next is a comparison chart of ideas (Figure 18) included with the text material explaining those ideas.

Respiratory Stimulants

The chief respiratory stimulants are carbon dioxide, caffeine, atropine, Coramine, and Metrazol. They act on the respiratory center in the brain and have been mentioned already on pages 347 - 348, under "Drugs Affecting the Nervous System." They are useful in a variety of respiratory diseases and disorders.

Carbon Dioxide: Carbon dioxide is a gas which increases the capacity of the lungs to take in oxygen and to expel carbon dioxide waste -- it deepens breathing. It is used to relieve asphyxia (suffocation) in carbon monoxide poisoning, to prevent postoperative pneumonia and to deepen breathing when anesthesia is used. It relieves postoperative hiccough; ordinary occasional hiccoughs, as well as hysterical hyperventilation, can be relieved by breathing and rebreathing into a paper bag held tightly over the mouth and nose. Otherwise, carbon dioxide is given by using a face mask attached to a tank of the gas. Overdosage causes difficult breathing (dyspnea), greatly increased movements of the chest and abdomen, and increased systolic blood pressure.

Caffeine: Caffeine stimulates the respiratory center. Some authorities believe that other stimulants now available are more effective.

Atropine: Atropine is often given with morphine to counteract the depressing effect of morphine on the respiratory center and to check mucus secretions and prevent spasm of the larynx.

Coramine: Coramine stimulates the respiratory center, increases the rate and depth of respirations and constricts surface blood vessels.

Metrazol: Metrazol stimulates the respiratory center and is especially effective in counteracting barbiturate poisoning. (Thompson & Rosdahl, 1973, 366)

Figure 18: Comparison Chart

Respiratory Stimulants

Stimulant	Use	Cautions
Carbon dioxide	- relieve suffocation, postoperative pneumonia and hiccough, hysterical hyperventilation	- overdose causes difficult breathing and increased systolic blood pressure
Caffeine	- general respiratory stimulant	
Atropine	- counteract depression of morphine, check mucous secretion, larynx spasm	
Coramine	- increases rate and depth of respiration, constricts surface blood vessels	
Metrazol	- counteracts barbituate poisoning	

Exercise B:

1) Simplistic comparison

Construct a comparison chart from the following selection on the recommended soft diet following surgery or trauma to the teeth (Torres & Ehrlich, 1980, 346-7). The 4 major food groups should be one part of the chart. Major comparison should be between those foods to be included and those to be omitted.

SOFT DIET

Frequently, following dental surgery or trauma to the teeth and mouth, the dentist will recommend to that patient that he have a soft diet for several days. Good nutrition will help to speed the healing process and, despite the diet restriction it is important that the patient have a well-balanced diet including foods from each of the four basic food groups, with emphasis on ample supplies of protein and vitamin C.

Milk group. Milk in all forms and soft cheeses such as cottage cheese and cream cheese are recommended. Also good are ice cream, pudding, custards, milk shakes and yogurt.

Meat group. In a soft diet, eggs can be eaten in omelet form, poached, soft cooked or scrambled. Fried eggs are not usually recommended. Fish, poultry or well-cooked meats that are not tough or fibrous can be included; however, meats should be ground or cooked until extremely tender, as in stewing, and then cut into very small pieces.

Vegetable-fruit group. Raw vegetables should be omitted from the soft diet; however, well-cooked vegetables such as asparagus tips and spinach may be included. Potatoes or potato substitutes, such as mashed white or sweet potatoes, macaroni, noodles or rice, are acceptable. Fried potatoes, roasted potatoes, potato chips and potato salad should be avoided. Broth, cream soups and vegetable soup made with thoroughly cooked and finely diced vegetables and meat are excellent in a soft diet.

Raw fruits, except ripe bananas or very soft mashed fruit with the skin and seeds removed, should be avoided. Canned or cooked fruits, free of tough membranes and seeds, can be used. Fruit juices, tomato juice, gelatine desserts and sherbet are all good in a soft diet.

Bread-cereal group. Hard rolls sandwiches, waffles, hot breads and whole-grain cereals should be avoided in the soft diet. Cooked cereals and cold cereals, crackers or enriched bread (without the crust) softened in milk are acceptable in the soft diet. (Torres & Ehrlich, 1980, 346-7)

Exercise B (Continued)

2) More difficult comparison

Construct a comparison chart from the following selection on destroying micro-organisms (Ferris, 1974, 84-5).

COLD TEMPERATURE

Cold, even freezing, is not a reliable method of killing bacteria. Low temperatures do retard their growth, thus preventing their ability to multiply rapidly and produce toxins. Therefore, the use of cold in some cases reduces the possibility of a disease advancing to a critical stage, but it does not cure the disease. An example of this is the "freezing" of the appendix by the use of ice packs. It is a temporary means of arresting appendicitis until conditions are favorable for the removal of the appendix. Freezing is a good method of preservation of certain foods, as it prevents the bacteria from carrying on their activities and causing decomposition and spoilage of the food.

DRYING

Drying is useful in the prevention of the growth of bacteria because, as we have learned in Topic 10, moisture is a requisite for bacterial growth. Some organisms can withstand more drying than others, as for example, spore-forming bacteria.

How effective drying may be in killing organisms depends upon many factors or variables, such as the kind of organisms, the number of cells to be killed, the thickness of the article to be sterilized, the temperature used and the presence or absence of oxygen. Some bacteria, like those which produce meningitis and gonorrhea, are killed by drying within a few hours; tuberculosis bacilli can withstand drying for several days or longer.

Spore-forming bacteria can withstand drying almost indefinitely; one investigator reported that anthrax bacteria were alive after forty years of drying in a glass bottle. Therefore, drying is not a very effective method for sterilization but it does serve its purpose by killing most of the active forms of bacteria and is very useful for preserving milk, fruits, and cereals.

LIGHT

Light, especially direct sunlight, has a destructive effect on living organisms on the surface of the skin and clothing. The visible rays of sunshine inhibit the growth of bacteria.

Ultraviolet light from lamps is one way of killing bacteria in the air of a room as well as killing some bacteria found in drinking water.

HIGH TEMPERATURES

Heat is by far the most effective of the physical agents of sterilization.

High temperatures are more destructive than low temperatures. Again, the length of time an article is subjected to the temperature is important; the longer the time, the more effective it will be in killing bacteria. The time is not counted from the moment the flame is lighted but from the time the particular, desired temperature or pressure has been reached. The higher the temperature used, the shorter the time required and vice versa.

The time and temperature combination required to kill a particular organism under laboratory conditions is called the thermal death time. Obviously, this will vary with each organism, with the number of organisms present and with the surroundings of the bacteria, such as the medium amount of moisture, etc.

There are four distinct ways in which a nurse may use heat to sterilize objects. They are as follows:

> Open Flame. An open flame of a Bunsen burner or stove may be used to sterilize objects which have come in contact with disease germs. We are all familiar with the common procedure of sterilizing a needle which is to be used to remove a splinter. We learned previously to sterilize the inoculating needle in this

way. Small articles which have come in contact with disease germs and which can be destroyed after use, may be burned. Such articles as paper handkerchiefs, tongue blades, sputum cups, swabs, cotton pledgets, dressings, magazines, and toys may be disposed of in this way.

Hot Air Oven. Dry heat from an oven can be used for sterilizing laboratory glassware, Petri dishes, sheets, towels, gauze, powders, fats, oils and waxes, needles and sharp instruments. Dry heat is less effective than moist heat so a higher temperature must be used; it would be 150° centigrade (320°F) for at least one hour to kill all bacteria. Dry heat is used for articles which would be injured by moist heat, such as gauze. Oils and powders used in medical treatment must be sterilized with hot air because steam cannot penetrate them.

Cause and Effect

Literature in health-related fields frequently teaches students to diagnose and correct common health problems of the body and of the mouth. Such discussions are generally written in a cause and effect format. Once again, the making of a chart can facilitate notetaking. In this case, cuases are listed in one column, opposite the possible effects. The columns may include categories other than "cause" and "effect" (Ex: "problem, symptoms, treatment"). (See Figure 19)

Example: The following textbook excerpt discusses food poisoning -- causes and effects, together with other categories pertaining to this specific health problem. An example of a "cause-effect" notetaking chart accompanies it.

The bacteria which cause food poisoning may be one of the following:

Staphylococcus. Found in creampuffs, custards, milk, fishcakes, chicken salad. This germ may be transmitted by a cook or server who has a pimple, boil or lacerated finger in which these bacteria abound. Thoroughly clean hands and freedom from infection would prevent this.

Streptococcus. Food handlers suffering from septic sore throat may infect foods.

Clostridium botulinum. This produces botulism, a highly-fatal disease. This germ is an anaerobic one which lives in soil. Although the germ itself is harmless to us if swallowed, its toxins produced in foods which have been improperly canned will cause death. Persons who eat spoiled sausages, or spoiled canned foods may get this disease. It can be prevented by

- Processing food in such a manner so that all spores may be killed. (pressure cooker)
- Heating any home-canned foods before tasting them. Boiling for 15 minutes destroys its toxins.
- Discarding without tasting all foods which show any change in appearance or odor.

Antitoxin exists for the clostridium toxin but in order to be effective it would have to be given immediately after eating the food.

Salmonella. Causes paratyphoid fever, an acute illness of short duration. This may be transmitted by contaminated poultry, meat insufficiently cooked, raw eggs, raw salads, greens, cold cuts, fish, potato salad. (Ferris, 1979, 112)

Figure 19: Cause and Effect Chart

Food Poisoning

Bacteria	Source	Effect	Prevention
Staphylococcus	food handler with pimple, boil or cut with bacteria		thoroughly clean hands and lack of infection
Streptococcus	food handler with septic sore throat		
Clostridium botulinum	spoiled sausage or canned food	fatal	discard spoiled food, boil home-canned food, correct processing
Salmonella	contaminated poultry, meat, raw eggs and vegetables		

Exercise C:

1) On a separate piece of paper construct a cause and effect chart, based on errors in technique of taking radiographs (O'Brien, 1977, 202-9). This is a direct cause-effect relationship of a simplistic nature.

ERRORS IN TECHNIQUE

Reversed Film. When the film is exposed with the wrong side facing the tube, the x-rays must pass through the lead foil backing. This backing prohibits some x-rays from reaching the film. The resultant images lack density, and the overall appearance is lighter and weaker than normal. You can also notice on the film

a peculiar pattern of dark marks known as the "herringbone pattern." This is due to the embossed pattern on the lead foil backing. The images on this film are reversed in relation to the embossed dot.

Saliva Leak. If the film is bent too sharply when you attempt to make it conform to the curbature of the mouth, the seal around the edge of the packet may break. This allows saliva to leak into the film. When it contacts the film emulsion, it causes the surrounding black envelope to adhere to the film. Later, when the film is stripped, the black paper envelope remains stuck to the film in these areas.

Double Exposure. A double exposure is the result when an exposed film is inadvertently placed back into the mouth and re-exposed. Because the film was exposed twice it has an overall appearance of being too dark.

Incorrect Film Placement. The root apices of the second molar are cut off at the top of the radiograph. This error was caused by not placing the inferior edge of the film parallel to the occlusal plane of the teeth. The posterior portion of the film was placed too low in relation to the teeth.

Double Image. A double image is caused when the film is moved slightly during the exposure and then held firmly in the new position during the remainder of the exposure. The image is doubled or has a shadowy appearance. Always instruct the patient to hold the film securely in the exact position you have placed it. The patient should let you know if the film moves during the exposure. If this is a problem with a particular patient you might use one of the many film holders on the market to hold the film in position. Once the film is in position, instruct the patient to bite on the holder to maintain the film position.

Blurred Image. A blurred image is usually caused when the tube head moves slightly back and forth during the exposure of the film. However, movement of the patient's head, as well as film slippage during the exposure, will tend to blur the image. (O'Brien, 1977, 202-9)

Exercise C (Continued)

2) On a separate piece of paper construct a cause and effect chart, based on malnutrition (Park, Ashman, Shelly, 1975, 240-1). There is more than one cause-effect relationship, with additional information that can be included in extra categories. This relationship is more complex.

CAUSES OF MALNUTRITION

Malnutrition may result when a diet is unbalanced or when there is a deficiency or an excess of one or more of the nutrients needed by the body, especially if this continues for a long time. The most common type of malnutrition in the United States is obesity, although there are also disturbances in growth and weight. Obesity increases the danger of diabetes, high blood pressure, gallbladder disease and some forms of heart disease.

Causes of an unsatisfactory diet may be the result of poverty, ignorance, improper preparation of foods or bad food habits. Even a good diet may lose nutritive value because of various processes and chemicals used to retard spoilage. The body's use of food can be adversely affected by diseased teeth and tonsils, gastrointestinal disturbances, insufficient sleep, lack of fresh air and sunshine or inadequate exercise and recreation. Faulty body processes result in the incomplete utilization of essential food elements. Nervousness and emotional stress prevent the body from receiving proper nourishment from food.

Examples of diseases of malnutrition are anemia, goiter, osteoporosis, osteomalacia, scurvy, beriberi, pellagra, cheilosis and rickets. Among the effects of malnutrition there may be poor calcification of tooth structure, though there may not be a great amount of caries. There may also be underdevelopment of the jaws, if malnutrition

existed during formation of these structures, or unhealthy soft tissues in children or adults. The possibility of these effects emphasized the importance of overall nutrition planning for good dental and total health during the formative years, including the prenatal period, infancy, childhood and adolescence.

Exercise D: Suggested Reinforcement Activities/Textbook

Select three sections from the material you will assign to your students in the textbook. These sections must include each of the logical relationships discussed above (classification, comparison, cause-effect). Record the location of each relationship of each section and complete a note chart of each, using given examples as models.

A. Classification:

	Pg. #	Topic
1.		
2.		
3.		

B. Comparison

	Pg. #	Topic
1.		
2.		
3.		

C. Cause-Effect

	Pg. #	Topic
1.		
2.		
3.		

Procedures:

Teaching Student to Recognize and Record Complex Information

Recognizing and recording complex information require higher-level comprehension skills, and are best introduced after the instruction and practice of paragraph comprehension. The three different relationships, together with the notetaking charts, should not be presented simultaneously. Students need to clearly understand the skill of classification, of comparison, and of cause-effect. Each skill with its appropriate notetaking chart should be introduced on a separate day.

With charting, explain that there is a definite relationship presented. This will help the students to recognize how to design the charts and to understand the organization of the material. Students need to know that one aspect of the relationship makes up one axis of the chart, while another aspect, the other axis.

If your text already presents charts or outlines of these types, the appropriate one should be presented first each day, followed by sample paragraphs or sections from which the students can construct charts as a class. Related homework assignments should be given as soon as the appropriate text selections are covered.

SECTION 8
DEVELOPING STUDY/READING SKILLS

DEVELOPING STUDY/READING SKILLS

Purpose:

Students of occupational skills need to develop certain study/reading behaviors to get the most from their reading materials. As a vocational teacher you can introduce these study techniques so that students can develop better study/reading habits. The following techniques are not difficult to instruct or to practice, but they will require repetition to be performed well. Some may seem awkward at first because of their newness, but students will become comfortable with them as they practice. When these techniques are used with students' own assigned reading materials, students should be able to see the benefits.

1) The Preview Procedure

A. Previewing the Entire Text

Have the students become acquainted with the total textbook before they begin reading individual chapters. They should be familiar with the overall contents of the book, the organization, and the aids which the author has provided. This would be assigned at the beginning of your course. A suggested format for previewing the entire text is included in Suggested Reinforcement Activities/Textbook in this section. This serves as a practical activity for you and can be used with your students.

B. Previewing the Text Chapter

The technique of previewing is getting an "overview" or a "general idea" of what the reading material is about -- before it is read. Previewing is performed by skimming, or moving the eyes and the mind very quickly over the information. Previewing before reading allows the student to see the big picture, to see what the author is going to discuss, and how the material is organized. Having this information before he/she reads helps the student to have improved comprehension during reading.

Previewing should be done quickly since students are to skim the material -- and not read it carefully. Therefore, students should spend no more than 5 minutes previewing a text chapter by skimming certain highlights the author has provided.

To obtain a quick overview, students should use the following guidelines:

Chapter title; illustrations, graphs, etc. plus captions; introduction; conclusion; bold, italicized print; subtitles; questions at the end.

You could initially introduce the guidelines for previewing. Then have the students practice the skill on chapters to be read. Time students for 5-7 minutes. At the end of the time limit, ask students orally what they found out and discuss as a group, or ask students

to write down what they learned about the chapter in those few minutes - words, phrases, names, complete ideas, etc. The recall should be done from memory since this forces the student to be more responsible for the information. As the class practices previewing, they will remember more with the same given time period.

Previewing is a very useful skill, and it does not require additional materials or large amounts of time. As an effective study technique it is largely recommended for classroom use. Students gain much more from their reading when they have ideas of what will be included in their reading than when they read "cold."

2) Recitation

Recitation is an oral or written recall (from memory) of material read. It is a helpful technique for students since it forces them to learn and remember the material rather than to copy it. They will have to assume responsibility for the information since they are working from memory. Benefits of recitation are improved concentration and comprehension.

Recitation can be a short activity of 2-3 minutes or it can last longer -- depending upon the task and the material. At first students will feel awkward utilizing this technique because they have had little practice with writing from

memory. They will become more comfortable and be able to recall more, as this skill is repeated.

Begin small and build. At first have students read 2-3 paragraphs and then write. Gradually increase the amount of reading. Practice this skill with your students throughout the course so that there is development.

The skill of recitation can be used in a variety of ways within your classroom. It is helpful at any-time when you want students to be involved, to learn and to remember material.

Possible activities include recitation:

1. after a chapter preview,
2. on an important section of information that needs to be reinforced and remembered,
3. periodically during reading of a text chapter,
4. as a review of class notes,
5. on supplementary material read (manufacturer's materials).

Another positive outgrowth of recitation is the written product. The students have organized and recorded thoughts on paper and this can be used for study purposes. This makes their time more efficient.

3) The Combination of Reading and Writing

The skills of reading and writing form a strong partnership. When a student reads material to be learned, he/she needs to write it down so that thoughts become organized and the student has a visual mode for commiting the material to memory. We all need to be "involved" as much as possible to acquire and to learn. Also, when a student writes down what he has read, he becomes aware of what he doesn't know or doesn't understand; he can <u>see</u> the "gaps." This is useful as a study/reading technique.

Involve your students in much writing, and in a variety of ways:

1) Written recitations,
2) Listing of important content vocabulary,
3) Paragraphs using important vocabulary and ideas to be learned,
4) Summaries of information learned about your occupational field from another reading source,
5) Written opinions about concerns and new trends in the occupational field.

In most professional fields, people must write in some form. You can help your students to gain confidence in this skill by giving them lots of practice, and at the same time help them to learn the information more completely.

4) Content Vocabulary Development

As previously mentioned in Developing Vocabulary Skills, "grasping" the content vocabulary is critical to the understanding of the health-related occupational literature. Emphasize throughout your course the need for learning the technical terms. Include them in your class discussions and in your homework assignments. (Refer to the activity suggestions in the vocabulary section of this book.)

5) Effective Reading Technique (Combination of Skills Currently Being Discussed

We do ask our students to study by themselves because we assume that by this age, they are able to do so. Many individuals, however, have not acquired efficient or useful skills -- especially for reading textbook chapters.

This section contains a brief overview of a study technique for textbook reading, which was orginally devised by Francis Robinson (1970). This technique has defined steps to be done in order, and it is intended to give students opportunity to better read, learn, and remember the information.

A typical procedure for students to use when studying a textbook assignment is to do nothing more than open the book and read the assignment. The more conscientious readers may follow up this initial reading by a second or even a third reading of the same useless type. Research has found a good method for helping the student to read a given selection with

better understanding and better recall. It is called the SQ4R method. It involves six basic steps: (1) Survey, (2) Question, (3) Read, (4) Recite, (5) Revise, (6) Review. Each of the steps is discussed under the appropriate headings below:

Survey: (same as preview)

Students use skimming technique to get a general idea of the chapter before it is read. This helps them to concentrate and to feel more involved as they read the chapter. To survey students glance at chapter title, subtitles, graphics, introduction, conclusion, bold and italicized type, questions at the end. Time allowed for survey is approximately 5 minutes.

After surveying, students should write down words and ideas from memory (recitation) -- what they know so far; they can spend 2-4 minutes on this. This helps them to see that they do have information before they begin reading.

(Surveying/Previewing is also discussed in this same larger section of Study/Reading Skills under 1-B.)

Question:

Students need guidelines for their reading. Using the information gained from the survey and the subtitles of the chapter, have students devise 7-8 questions. The questions should pertain to information included in the chapter and ones which they feel will be answered by the author. Questions need not be elaborate; their major purposes are further preparation for reading and

something for students to look for as they read. Questions are to be written down. This step should take approximately 10 minutes.

Read:

Keeping in mind the information gained thus far from the survey and question steps, the student begins reading -- looking for answers to the questions formed, and reading to learn the information. He is reading for important ideas now that he is study/reading. To hold concentration and to get the most out of the reading, encourage students to read for short blocks of time initially and build gradually. Begin with 10 minutes of concentrated reading.

Recite:

After a certain period of reading time, students should stop and write down ideas from memory (recitation). In this recitation they will include any answers to questions that may have been discovered and the important/main ideas of what they have read. This step helps them to learn and remember the information. They should keep the reading recitation with the survey recitation and the questions - so that a written sequence of study is available to them. This step takes 5-7 minutes.

Revise:

To insure accuracy students should open their text and see if they have recorded information correctly. Plus, they may want to make some additions of ideas missed. This step will require 2-4 minutes.

***THE READ, RECITE AND REVISE STEPS ARE THEN REPEATED UNTIL THE CHAPTER IS COMPLETE. IT IS IMPORTANT THAT STUDENTS UNDERSTAND TO REPEAT THESE 3 STEPS ONLY. PREVIEW AND QUESTIONS ARE PERFORMED ONCE PER CHAPTER.

Review:

With this technique students have a written produce to review. They should periodically review the survey, questions, reading recitations and revisions. When chapter is finished they can review the completed written process for their exam.

Benefits of the SQ4R:

1) Students have a written product for review and do not have to reread the chapter 2-3 times.

2) With so much writing students can learn the information more thoroughly.

3) In writing about what they are reading, students can see areas which are unclear and difficult and can seek help.

4) When students change subtitles within a chapter to questions and then read to answer those questions, much more will be obtained than if they merely read and answer questions at the end of the chapter. Students often copy to answer questions assigned. The process of formulating questions is a thinking exercise which "tunes students into the assignment."

5) Recitation (writing from memory) after reading helps students to learn information and they must understand it to write it down -- since they must depend of memory.

Teaching the SQ4R:

1. This procedure requires more time than merely reading a chapter, but the long-term rewards are there. Students do not have to reread chapters, just review certain parts. Also, the written notes can be used for consistent review and cramming the chapter the night before the exam is not necessary. Please emphasize these points with your students.
2. When teaching the procedure, introduce each step adequately. Explain "how" and "why" of each step so students feel comfortable and can recognize the benefits. Do not introduce all six steps at once. For example, on Monday, discuss previewing and practice for 2 days. Then add the question step and practice. Next, introduce the read, recite and revise steps as a unit and assign considerable practice to this. Then the students are ready to do the whole procedure on a chapter they have not read.
3. Use a format for the writing of their information, such as the one in Suggested Reinforcement Activities/Textbook #4. This gives organization to their written notes and definite guidelines for completing the technique.
4. Explain clearly the purpose for utilizing the SQ4R with textbook chapters.
5. Use the suggested time limits when teaching this technique to your students. Encourage them to stick to the time limits when they are working through the SQ4R on their own, since this keeps the system more time-efficient.

6. To be effective, this technique must be practiced over a long period of time. Assign this to be done for much of your reading assignments.
7. Students can work in class and at home with this technique. After the steps are understood, it is a good independent activity.
8. The SQ4R can be used with more than an entire text chapter. It can be used with chapter sections or with occupational handouts. Some adjustment of steps may be necessary - timewise, but the same sequence may be used with most reading materials.

Study Reading Skills

Exercise - Suggested Reinforcement Activities/Textbook

1) A. Previewing the Entire Text

Complete the following information by previewing the textbook which you use in your teaching.

1. Title:

   Author:

   Publisher:

   Copyright Date:

2. What is this book mainly about?

3. Look at the Table of Contents. What major topics are covered in the book?

4. Read the preface or introduction. Briefly, what does it say?

5. What types of graphics are in this text? (diagrams, photographs, charts, drawings, etc.)

6. Is this text well-organized in your opinion? Explain

7. Is this text easy to read or is it more difficult? Why?

8. Does the text have:

Preface or Introduction	_____	Chapter subtitles	_____
Table of Contents	_____	Chapter summaries	_____
Index	_____	Activities at end of chapter	_____
Glossary	_____		

B. Previewing the Chapter

Select 3 chapters from the text which you use in your classroom. Allow yourself 5 minutes to preview each chapter. At the end of the 5 minutes, write <u>from memory</u> what you learned. For previewing, use the guidelines listed in the discussion of previewing the text chapter.

*Also, try previewing other material which you have not read, so as to fully understand the skills your students will need to use.

Complete the following chart:

	Chapter #	Words and Ideas from Preview
1.		
2.		
3.		

2) Recitation

Select 4 sections of information throughout your textbook. Begin small (2-3 paragraphs) and gradually increase to a longer selection (2-3 pages). With each selection, read the material, close your book, and record information from memory (main ideas, important facts, vocabulary words). Use the following chart as a model and record the ideas on a separate sheet of paper.

	Page #	Recitation (written)
1.		
2.		
3.		
4.		

3) Content Vocabulary

Select 3 introductory chapters from the text you use with your students. List ten content words from each chapter that are essential to know for understanding of the material.

	Chapter #	Page #	Content words
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			

	Chapter #	Page #	Content words
14.			
15.			
16.			
17.			
18.			
19.			
20.			
21.			
22.			
23.			
24.			
25.			
26.			
27.			
28.			
29.			
30.			

4) The SQ4R Technique

Select a chapter you will assign to your students. Read the chapter according to the designated guidelines. Try to stick closely to suggested time limits. As you work through your chapter, complete the following form. (This same form should be used by students.)

I. Text title:

Chapter title:

II. Survey Recitation
(Record from memory what you learned in the survey.)

III. Questions
(Give yourself something to look for in the reading.)

IV. A. Reading Recitation I
(Record from memory what you learned during your first reading.)

B. Revisions

V. A. Reading Recitation II

B. Revisions

VI. A. Reading Recitation III

B. Revisions

*Use own paper if more space for reading recitation and revisions is needed. Do remember to read, recite, and revise to the end of the chapter.

Procedures: Teaching Students Study/Reading Skills

Study/reading skills lend strong support to being an efficient student. Practice with them will benefit performance in the health-related courses.

The techniques discussed can develop into natural study habits when they are introduced gradually, reinforced strongly and practiced throughout the course. The techniques do not necessarily require extra time, just different procedure.

To become personally familiar with the suggested study/reading behaviors, practice them by completing the activities included in "Suggested Reinforcememt Activities/Textbook." When you feel comfortable with the techniques, pass them on to your students. You may use the same activities with them, since the exercises are specific to the skills, but possible for a variety of materials.

SECTION 9

GUIDELINES: MAKING A READING ASSIGNMENT

GUIDELINES/ MAKING A READING ASSIGNMENT

As was discussed earlier, students need guidance to acquire "the most" from a reading assignment. The SQ4R Method was described and recommended as an effective study/reading technique for health-related text materials. This method is good for independent student work.

If you have a section of a text chapter, an essay, or a shorter occupational selection that you wish to cover in class as a total group activity, you can use the same procedure, but in an adapted form. Remember that it is important to "direct" the reading assignment; students will gain more, and you will see better results.

The following steps are suggested for directing a reading assignment:

1) Readiness

   A. Ask students questions related to the topic to be read: "What do you know about . . .?" "Have you ever read about . . .?"

   B. Ask students questions concerning personal experiences related to the selection: "Have you ever gone to the dentist and felt fear?" "Explain your ideas about . . . based on your past experience." "As a child did you ever . . .?"

   C. Introduce and discuss vocabulary terms which are important to the understanding of the reading. Place these on the board. Ask students if they know anything about any of the words; this will initiate discussion and you can briefly explain those terms that are totally unfamiliar.

D. Have students preview by glancing quickly over the material to get a general idea of what they will be reading about. Discuss as a group what the preview indicates will be contained in the material.

2) Purpose-Setting

Ask students to read for a specific purpose or purposes. Place a question on the board for them to keep in mind when reading. Looking for specific information will help them to concentrate more on the entire reading assignment. Also, ask students to add one or two questions to the purpose-setting, based on their preview and what they feel will be contained in the selection.

3) Silent Reading (Directed Reading)

Students will read the material silently, keeping in mind the vocabulary, the preview, and the purpose-setting. They have been prepared for the reading and now their reading is directed.

4) Purpose Check

Ask students for answers to the purpose-setting questions. This may result in a comprehensive class discussion, which students ask more questions and misconceptions are clarified.

5) Oral Re-reading

Ask students one or two questions in which the answer needs to be read aloud from the selection. Students will need to skim for the specific answer and this serves as a review. This task is appropriate for concepts which are more difficult and need to be reinforced.

6) Comprehension Check

If there is much information to be learned in your assigned selection you may want your students to answer more questions, written or oral. (In some cases the "purpose check" discussion will be sufficient.)

If you think more feedback is necessary, you can develop different levels of questions to evaluate comprehension.

Examples:

a. Why?
b. How?
c. Opinion questions
d. Vocabulary or phrases
e. Completion
f. Essay
g. Inference - not directly stated - "From the selection you can tell . . ."

7) Follow-up Activities

During this step the students are expected to increase their knowledge and use the information gained during the directed reading. Here the students apply the information so that it can be learned and remembered. Suggested activities are:

a. Writing assignment,
b. Further reading in other sources on the same topic,
c. Research project-library,
d. Interviewing a person who is informed on the topic.

Discussion: Helping Students Get More Out of a Reading Assignment

These suggested steps in directing a reading assignment may seem awkward or too time-comsuming upon first review. However, the process of preparation through follow-up is sequentially constructed for improved comprehension with a reading assignment. The process lends much guidance to a reading selection as a group activity and both you and your students will see the benefits.

SECTION 10
FURTHER SUGGESTIONS: READING SKILLS DEVELOPMENT

FURTHER SUGGESTIONS/ READING SKILLS DEVELOPMENT

There are many components of effective reading skill development. These should be considered when integrating reading skills with the occupational content. This text has covered skill areas of vocabulary comprehension, and study-reading.

Following are suggestions for certain procedures which can be further beneficial in the instruction of reading skills:

A. Increased Student Responsibility

Skills require practice, and student responsibility in the improvement of the instructed skills should be emphasized. Make extensive outside assignments of the suggested activities introduced in this text, as well as practice in the classroom. Students will be using the occupational materials which you wish them to know, so extra planning for you is minimal. Plus, the "manipulation" of the material through the skill practice will help students to really learn the information required in the health-related field.

B. Evaluation of Activities

With the recommendation of many assigned skill activities, you may wonder how you will grade them. There are ways to give students ample responsibility and avoid the "not enough time to grade" dilemna.

1) Not all assignments must receive a letter grade. Some activities are assigned strictly as practice and should only receive a credit grade for completion. The practice, however, should be accompanied with class discussions of specific guidelines for practicing the skill and of problems which arise as students work with the skills. (Credit Grades: + ✓+ ✓ ✓-)

2) Students, after having guidelines for performing the skills, can work in pairs and evaluate each other's work. Students often encounter the same difficulties and can help each other better understand what to do.

3) Explain to your students that some assigned work is for practice over a period of time and must be compiled as a notebook for a composite grade. Students would begin with the easier skills and build to the more difficult ones -- using the material which are required for your course. With this, evaluation occurs less frequently.

C. Student Evaluation

Increased student responsibility can also include written evaluation of activity and/or of own performance. Have students evaluate certain units of study or sets of skill activities. Their input can help you to make improvements and to better recognize some of their needs. Set up specific criteria, such as "excellent, very good, satisfactory, unsatisfactory" -- as an overall rating. Then ask for specific comments as to strengths, needed improvements, possible additions, etc. These same ideas can be transferred to a self-evaluation form for performance on an activity or group of activities.

Student evaluation forms can be simplistic so that exact guidelines are known, and so that students feel comfortable with this process. With the evaluations students can have more input into course planning and can become more aware of personal performance.

D. Instructing Skills Together

The major reading skill areas mesh well together, and can be combined effectively in instruction. Vocabulary does not have to be developed separately from comprehension. For example, contextual analysis can be introduced and practiced briefly, and then the main idea could be presented. These two skill areas could be practiced together on the same selection, or could be done on different materials, but within the same class period.

Vocabulary, comprehension and study/reading skills can be combined throughout your course. Students will be able to see how skills do depend on each other and that reading skill development is a total package -- which should be continued as such.

E. Writing Skills

The importance of increased writing experience has been discussed earlier in "Developing Study/Reading Skills." Writing involves the student more in the material to be

learned, helps the student to organize thoughts and to understand and remember the information, and provides practice for a skill which is considered deficient in much of our population. Integrating reading and writing skills should add a well-rounded dimension to your instruction.

A useful activity with writing skills is to have your students write in their own words. Here, the students must understand the material. Repeated practice will enable them to build confidence and to greatly improve their ability to write in their own words.

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